AMERICAN
# GAS JOURNAL
Established 1859 Pioneer of the Gas Industry

VOL. 126 No. 24
WHOLE No. 3687

NEW YORK, SATURDAY, JUNE 11, 1927

Subscription $5 Per Year
$6 Canada $8 Foreign

ANNOUNCING

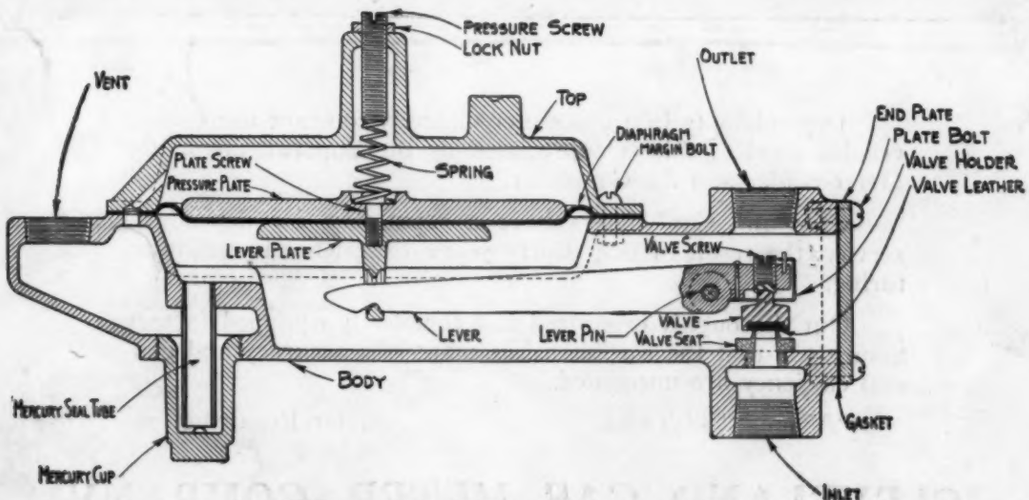
The GROBLE REGULATOR

IT'S NEW!

FOR

**High, intermediate and low pressure**
**with or without mercury seal**
**spring or dead-weight type**
**quick removable and interchangeable valve**

*ALL PARTS STANDARD & INTERCHANGEABLE*




*We solicit your inquiries*

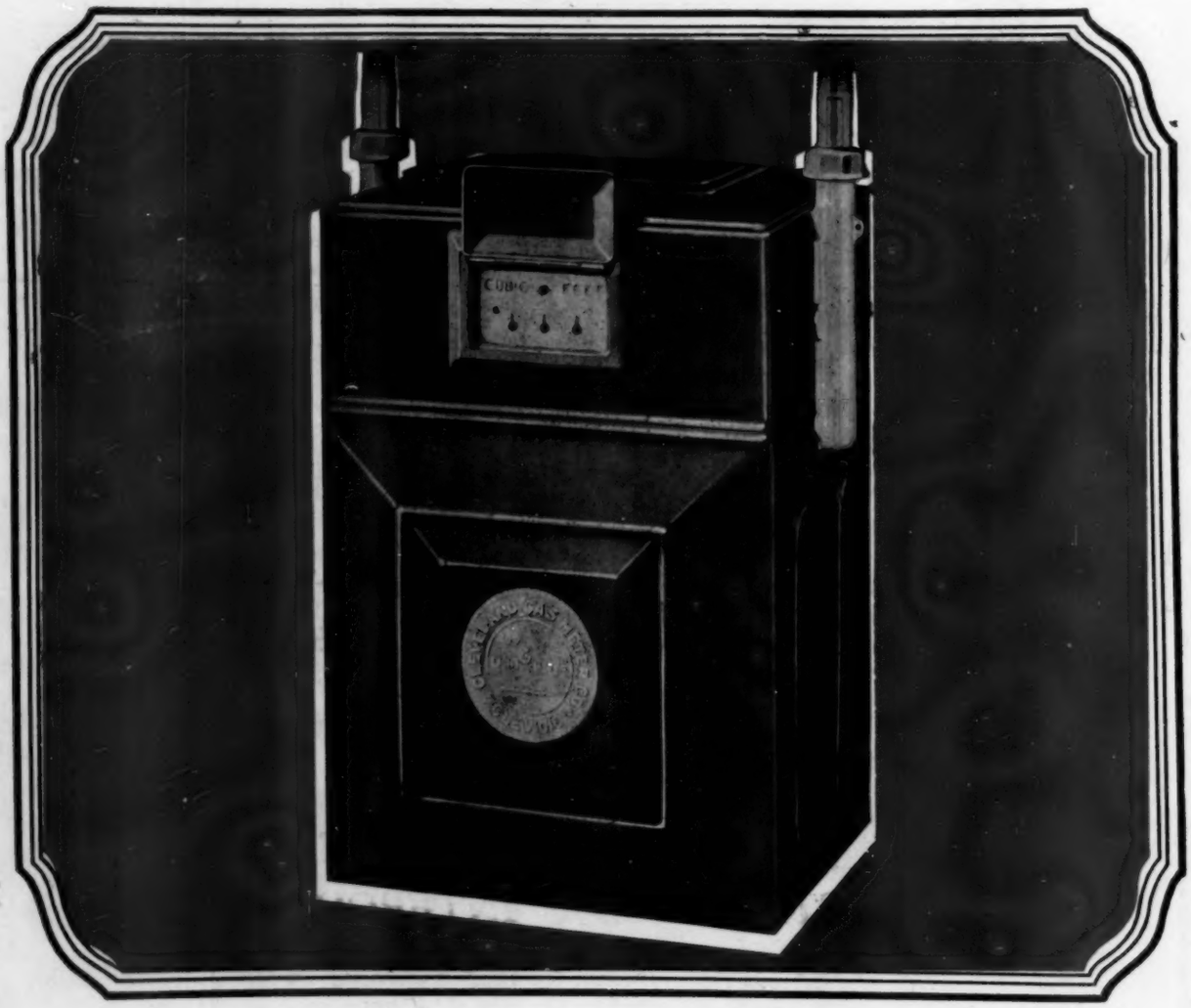
**GROBLE GAS REGULATOR CO.**

**ANDERSON, INDIANA**

Library of Congress
JUN 14 1927
Smithsonian Deposit

Advertising Index, page 39

Index to Contents, page 4



Dependability in a gas meter means a constant measure of reliable service; this is appreciated by the Superintendent, the Meter-reader and the Consumer.

Cleveland Gas Meters have a reputation for dependable service, the result of over thirty years' experience in manufacturing.

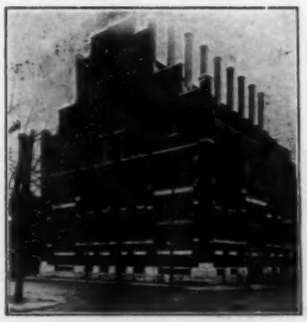
Our thoroughly organized and completely equipped factory assure you that the workmanship, materials, accuracy and general efficiency are unequaled.

"A" and "B" Types Meter Repairing

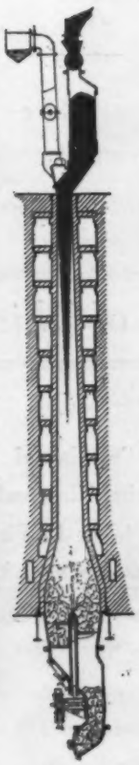
**CLEVELAND GAS METER COMPANY**

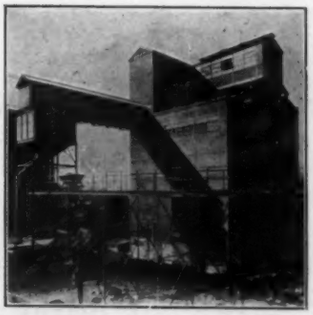
**2180 East 65th Street** **Cleveland, Ohio**

# GLOVER-WEST
# *Vertical Retorts*

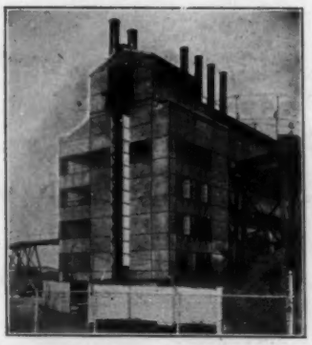


Toronto, Ont.
5,000,000 cu. ft. per day

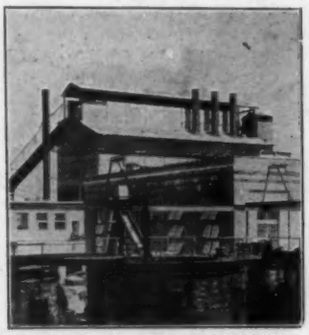




Fargo, N. D.
800,000 cu. ft. per day



Portland, Me., 2nd Plant
750,000 cu. ft. per day



Fall River, Mass.
1,600,000 cu. ft. per day

## Plants *Completed* in 1926 and 1927

**Also Completed—Stamford, Conn., 1,100,000 cu ft.; Buenos Aires, 3,500,000 cu. ft. Santiago, Chile, 3,000,000 cu. ft.; Toronto, Ont., 600,000 cu. ft. (extension)**

**Under Construction**

**Springfield, Mass. ..... 2,800,000 cu. ft.**

**Pawtucket, R. I. ..... 1,060,000 cu. ft.**

**Faribault, Minn. ..... 400,000 cu. ft.**

## WEST GAS IMPROVEMENT CO.

*Builders of Coal Gas Plants*

441 Lexington Ave. New York.

# American Gas Journal

SIXTY-SEVENTH YEAR

*Published Weekly by American Gas Light Journal, Inc., 53 Park Place, New York, N. Y.*
S. G. KRAKE, Pres. and Treas. A. M. GLEASON, Sec'y

STANTON G. KRAKE, Managing Editor HENRY M. RILEY, Editor
Ismar Ginsberg, Associate Editor

*"MEMBER OF THE AUDIT BUREAU OF CIRCULATIONS"*

## *Contents of This Issue*

**Educating the Children—Joe Carmichael** ..... **573**
**Recent Developments in Carbonizing and Processing Coal in Relation to the Gas Industry—A. C. Fieldner**..... **576**
**Factors Affecting the Possibilities and Trend of the Domestic Gas Consumption—Thomas F. Kennedy** ..... **581**
**Window Display Advertising—Ray Martin** ..... **586**
**As the Journal Views It**..... **587**
**Industrial Gas Lesson—Lesson No. 173**..... **588**
**Hazards from Fire—I. V. Brumbaugh** ..... **589**
**Annual Meeting of Woman's Section, Empire State Gas & Electric Association—Edith Yeager** ..... **591**
**Progress in Gas Technology**..... **593**
**News of the Gas Industry**..... **594**

**Subscription $3.00 per year, including postage, in the United States, Mexico, Cuba, Porto Rico, Hawaii or the Philippines; in Canada, $4.00; foreign, $5.00—Single Copies, 10 cents.**

AMERICAN GAS JOURNAL, JUNE 11, 1927. Vol. 126. No. 24.
Published weekly by American Gas Light Journal, Inc., New York, N. Y.
Entered as second-class matter Jan. 9, 1917, at the post-office at New York, N. Y., under the Act of March 3, 1879.

AMERICAN
GAS JOURNAL
*Established 1859— Pioneer of the Gas Industry*

Vol. 126. No. 24 NEW YORK, JUNE 11, 1927 Whole No. 3636

# Educating the Children in Gas Matters

## Use of interesting booklets found beneficial

*Joe Carmichael*

Director, Iowa Committee on Public Utility Information

HUNDREDS of thousands of American school children are studying the manufacture of gas in their classrooms as a result of activities of committees on public utility information. Many of them, probably most of them, are supplementing this study by visits to the gas plants to witness the actual operation of the process. Practical talks by gas men to the school classes still further extend this knowledge.

This is a result of the free distribution of educational bulletins, carefully prepared and explaining in simple language the various processes for the manufacture of gas, its distribution, the financial set-up of the companies, their regulation and the history of the development of the industry. Though issued separately by many state committees, the bulletins are similar in their nature, being reworded to comply with the state situations.

### Benefits Incalculable

As a builder of friendship the benefits are incalculable. The story of gas is being carried each year to an army of new citizens. To them the gas house is no longer an odoriferous place of mystery. The gas tank will mean something besides an unsightly pile. When the student lights the gas stove or heater he will know something of the problem of the distribution of gas to his home, how constant pressure is maintained, and why he is able to avail himself of its comfort and convenience at any hour of the day or night. He will know the gas man by personal contact. He will know of the latter's painstaking effort to provide a uniform high-grade product and his ceaseless vigilance to maintain service.

And he will know something of the many other uses for gas besides providing a dependable fuel for cooking meals.

The bulletins are non-technical, couched in simple language and printed on a good grade of paper in convenient form. Usually they comprise about twelve pages of reading matter, diagrams, charts and illustrations. The romantic history of gas is outlined, then the manufacture and distribution, then something of the organization of the company, how it is financed, and how it is regulated. The illustrations show pictures of men historic in the early development of the industry and diagrams of gas plants, meters and by-products. The student is shown visually how to read a meter. Some of the thousands of varied uses for gas are indicated.

And the greatest care is exercised to avoid controversial subjects or anything that could be construed as objectionable propaganda. The preparation of the bulletins is the result of the co-operation of executives, engineers, attorneys, manufacturers and writers.

### Work Long and Arduous

The work of building up this clientele has not been one of a day or a year. The first bulletins were issued over five years ago. The result of the committee efforts has been cumulative. At first in some quarters there was, if not opposition, at least challenge as to the purpose of the donors in offering something for nothing. School teachers are ordinarily jealous of their responsibility.

"What is it you want?" they will ask, when confronted with a proposition to furnish free text books.

The answer has been frank:

"We want you and your students to know more about the gas business. It is an industry entering intimately into the everyday life of a majority of the citizens of the United States. Fifty-two million people use gas every day. Nearly every citizen is affected indirectly by its use, owing to its growing importance in industry.

"It is no longer and never can be again a strictly

private business. The public weal has made it a public utility in every sense of the word. We want you and your students to have a fundamental knowledge of the gas business, not only its manufacture, but its problems of distribution and financing.

"And we who are in the position of managers of this business for the public deem it a good investment to spend the little money required for the purpose to set before you the fundamentals of the industry."

And the answer has been cordially responsive.

Each year the bulletins go into more schools. And teachers who have already used them invariably apply for copies for their new classes as they come in.

Manufactured Gas
A brief story of the discovery and development of Gas and a simple description of modern methods of manufacture and distribution.
THE IOWA COMMITTEE ON PUBLIC UTILITY INFORMATION
310 Crocker Building
Des Moines, Iowa

*Booklet for Distribution to School Children*

### How Distributed

At the opening of every school year circular letters are sent to the schools explaining what the bulletins are and how they can be secured. A copy is enclosed. The teachers are asked to look it over carefully. Suggestions as to changes are sought, if any of the matter is found to be objectionable. Some of the committees circularize only high schools. Others offer them to grade schools, public, parochial and private. Many colleges consider them not too simple for their use.

It is suggested that they be used in the science, or civics, or economics classes. This is optional, however. The teacher may use them as is deemed advisable. He may have as many copies as he wishes so that each student may have one and keep it. Some committees send stamped and addressed envelopes for reply to make it more easy to secure orders. Others deem it wiser to wait until the teacher is sufficiently convinced of the merit of the use of the bulletins to write a personal letter asking for them.

Teachers have district and state meetings to exchange ideas and experiences. Frequently they discuss these bulletins and recommend their use to each other. This brings additional orders. Directors of committees seek opportunities to address teachers' meetings and explain the purpose of the bulletins frankly. Some committees advertise them in teachers' magazines.

### Modern Sales Methods Used

A careful check of the schools which have been solicited is kept. After a month or six weeks, if no reply from a school has been received, a follow-up letter is sent repeating the offer. If no reply is forthcoming from this second letter, the local gas company manager is asked to bring the bulletin to the attention of the school principal personally.

When an order for the bulletins is received from a school the director notifies the manager of the gas company in the town or in the nearest locality. It is suggested to him that he extend an invitation to the class studying the bulletins to visit his plant. It is also suggested that he co-operate by seeking an opportunity to talk to the class in the class-room on the fundamentals of the industry.

A follow-up system is maintained to ascertain what are the results. Are the bulletins actually used, and to what extent? Are visits made to the gas plants? Do gas plant managers or others connected with the organization supplement the instruction by personal talks to the classes, explaining in more detail their operation? Are local managers working to make this contact with their schools permanent? The committees receive hundreds of responses, splendid letters expressing appreciation of the efforts of the industry to spread this information.

Some of these letters read like patent medicine advertising testimonials:

"It is one of the finest and most practical ideas ever brought to the attention of the teachers and students in high schools," says Principal R. A. Burrows of the Anthon, Iowa, high school.

"I have used these bulletins in my class work for the past three years," is the expression of L. J. Botleman, of Tracy, Iowa. "I find the students very glad to get them. I use them in class work and have tried out the suggestions offered and have found them of great value."

Miss Mabel Fisher, of the Indianola, Iowa, public schools, says: "I have used your pamphlets for two years. I like them very much and would like copies for a class of 70."

Milton Kushner, of the Milford, Iowa, high school, finds "these bulletins to be very interesting and instructive in the class-room, more so than the text book in many instances."

"I think them of value for every high school student," writes Principal Quincy A. Wemple, of the Rock Falls, Iowa, high school.

One instructor writes at considerable length, stating that not only are the bulletins used by six of his classes, but that the students in each class are taken to the gas plant, where the operation of making gas is explained. And they are also taken to the meter shop. Here they are shown how a meter operates and how to read it and figure out a bill. Then they make another trip to the company's display room, where the latest gas appliances are demonstrated. He requires his students to submit drawings showing the process of the manufacture of gas and also of the mechanism of the meter. Every student must know how to read a meter accurately. They receive credits for this work just as they do in other studies.

Every State Committee on Public Utility Information that has used these bulletins receives similar letters from instructors, all testifying to the value of the work.

A dozen or more state committees are issuing these bulletins. Usually the bulletin refers to the situation in that state, statistics being given as to the number of plants, output, valuation, regulation, etc. The bulletins would be of less value outside the borders of that state.

### Any State Committee Can Get Bulletins

The American Gas Association has, however, prepared a bulletin similar to the ones issued by the state committees for use in states that have issued none of their own. This A. G. A. bulletin discusses the industry in more general terms, but is of great value as an educational medium.

It is interesting to note that these bulletins are being used as text books not only in cities and towns that have gas service, but in small towns and rural communities that are miles from a gas plant. The committees furnish the classes in these communities with this literature just as readily as they do those in larger cities. They reason that many of these students will be removing to communities where gas service is available. Or if not, they are potential voters and the gas industry, just as other public utilities, depends for legislation and regulation not only on its own customers, but on the whole body politic.

The Committees on Public Utility Information believe that this is one of the most important activities they have undertaken. They are building for the future. These students of today will soon be going out into the business world or into the homes and in a few years will be citizens with a vote. With the more intimate knowledge of the public utilities which they have gained in the schools they will be more interested in the problems which they will be called on to assist the utility companies in solving.

¤ ¤ ¤ ¤

## GAS REFRIGERATORS FOR NEWEST APARTMENT HOTEL

The first apartment hotel to be completely equipped with refrigerators operated by manufactured gas is now under construction in New York City and will be ready for occupancy October 1st next, according to an announcement by the Consolidated Gas Company. This apartment hotel is the twenty-two story "Lombardy," which is being erected on 56th Street, near Park Avenue, by the Henry Mandel Building Company, Inc., for the One Park Avenue Corporation, owners. Farrar & Watmough are the architects.

In making the announcement a representative of the Gas Company said that a contract with the owners specifies the immediate installation of one hundred gas refrigeration units. Additional units will be installed in the other sixty-seven apartments. The units, which will be housed in specially manufactured refrigerators, vary in size to meet the respective needs of the larger and smaller apartments which range from one to seven rooms each.

The new type of gas refrigerator, which has been in the course of development for more than two years, is said by Gas Company engineers to be a highly successful solution of the refrigeration problem.

The adoption of the gas operated refrigerator was made after an exhaustive study by the architects, who chose it because of its low cost of operation, the absence of moving parts and the consequent noiselessness, and the economy of space.

¤ ¤ ¤ ¤

ICE,—By the Use of Gas
The new gas refrigerator is silent in operation. It has no moving parts to wear out or cause vibration and noise.
A small gas flame with thermostatic control preserves your food at the proper dry cold.
See this new household convenience in operation at your Gas Office.
Complete information may be had by filling out and mailing the coupon.
Mail This Coupon NOW
The Brooklyn Union Gas Company, New Business Department, 183 Remsen Street, Brooklyn, New York.
I am interested in the new gas refrigerator. Please send me full particulars.
Name
Street
City State
Telephone: TRIangle 7500
The Brooklyn Union Gas Company
*Let Gas Cool Your Summer Drinks*

# Recent Developments in Carbonizing and Processing Coal in Relation to the Gas Industry*

*A. C. Fieldner*
Chief Chemist, U. S. Bureau of Mines

### Introduction

IF ANYONE were to ask me, "What was the greatest event in coal technology during the year 1926?" I should reply, without hesitation, "The International Conference on Bituminous Coal at the Carnegie Institute of Technology in Pittsburgh." It was an outstanding event because it marked the culmination of a constantly growing interest in the carbonizing and processing of coal which has been spreading not only through the ranks of scientists and engineers, but among industrial executives and financiers as well. The 1700 men who attended this meeting were drawn from a variety of industries including coal, gas, petroleum, synthetic chemicals, power, business, and finance. Their intense interest in the speakers and the subjects discussed was manifested by the deserted lobbies and the crowded lecture halls during the progress of the meeting. Indeed, this conference was an unusual opportunity for meeting the leading European investigators in the field of coal processing, especially those engaged on the conversion of coal to oil, alcohol, gasoline, and other hydrocarbons. The proceedings of the conference, covering about 900 pages, are from Carnegie Insitute of Technology at Pittsburgh.

### Gas Man Concerned With Developments

Dr. C. H. Lander, director of the Fuel Research Board, and Harald Nielsen of England; Dr. Yoshikiyo Oshima, director of the Imperial Fuel Research Institute of Japan; our own Professor Parr, and a group of American inventors and carbonization engineers discussed and described a variety of processes for low-temperature carbonization in various stages of large-scale development. Dr. Franz Fischer, of Germany exhibited samples of synthetic hydrocarbons—gasoline, oil, and paraffin—made from water-gas at the Institute of Coal Research in Mulheim. General Georges Patart discussed the catalytic synthesis of methanol and higher alcohols from water-gas under pressure; and Dr. Friederich Bergius described the development of his process for the liquefaction of coal by direct hydrogenation at high pressures and high temperature. The keynote of the conference was the conversion of coal—a solid fuel—to liquid fuels as distinguished from the carbonization and gasification of coal as practised in the gas industry. However, the gas man naturally is concerned with these new developments because they may have some influence on the trend of the gas industry. Therefore, I will review briefly the present status of these new developments, and discuss their influence on the gas industry as I see it.

The new developments in coal processing may be conveniently discussed under the following five heads:

1. Complete gasification.
2. Low-temperature carbonization.
3. The Bergius process for hydrogenating and liquefying coal.
4. The pressure synthesis of alcohols from water-gas in the presence of catalysts.
5. The catalytic synthesis of hydrocarbons from water-gas at atmospheric pressure.

### Complete Gasification of Coal—American Practice

Complete gasification of coal in the broadest sense of the term is an old industrial process, as exemplified in the manufacture of producer gas and water-gas. It may be conducted in one stage as in the direct gasification of anthracite or bituminous coal, or in two stages as when coke is used as the generator or producer fuel. I need not dwell on the great progress made in recent years in the use of bituminous coal in water-gas machines, because this process had its start in your district during the war period when the usual supply of coke and anthracite was subject to interruption, and W. W. Odell in February presented a paper on this subject before the American Institute of Mining and Metallurgical Engineers at New York.

However, the gas obtained by this method with bituminous coal fuel is not of much greater heating value than blue-gas made from coke, owing to the decomposition of most of the methane and other constituents of high heating value of the distillation gases. Many attempts have therefore been made to develop a single-unit complete gasification process which preserves the distillation gases, as is done in the two-stage process of carbonization of coal in ovens or retorts and gasification of the resultant coke in water-gas generators.

### European Practice—The Strache Generator

Developments in this direction seem to have met with some degree of success in Europe, as for example, the Strache generators that have been installed at Chemnitz, Germany; Gratz, Austria; and certain other towns in Italy, Austria and Czecho-Slovakia. However, no plant of this type has yet become commercially operative in the United States. Experiments are still in progress and I believe that eventually an apparatus cheaper and more efficient than the present two-unit combination of coke oven and water-gas sets will be developed, at least for

* Paper presented with the approval of the Director, U. S. Bureau of Mines, at meeting of Illinois Gas Association, Springfield, Illinois, March 17-18, 1927.

non-coking and weakly coking types of coal. The gas from such a complete gasification unit should have a gross heating value of from 350 to 390 B.t.u. per cubic foot.

The Strache double-gas generator consists essentially of a vertical carbonizing retort superimposed on a water-gas generator. During the "blow period," air is blown through the gasification chamber at the bottom. The hot combustion gases containing some carbon monoxide pass around the superimposed vertical retort and through the superheater, in whose bottom they are mixed with air and burned, thus heating up the checker work. As soon as the coke column in the gasification chamber, and the checker brick in the steam superheater are sufficiently hot, the valves are reversed, steam is passed through the incandescent fuel-bed in the gasification chamber, making water-gas. The hot gas during the "make" period passes up through the column of coal in the superimposed retort, aiding in its carbonization and mixing with the distillation gases. The coal is largely carbonized at low temperatures and gives large yields of tar and by-products. The cycle is repeated as soon as the temperature of the fuel-bed becomes too low for formation of water-gas.

The products of combustion from the superheater are said to contain enough heat to furnish the steam required in the process. Strache claims a total efficiency of 65 to 70 per cent with this process, without use of waste-heat boiler. With ordinary bituminous coal from 50,000 to 55,000 cu. ft. of 350 B.t.u. gas are obtained per short ton.[1]

On my visit to Germany in 1924 I was informed that the Strache plant at Chemnitz, Germany, was operating without trouble on mixtures of non-coking coal and lignite, but it did not operate satisfactorily on coking bituminous coal on account of sticking of the charge in the carbonizing retort. It is this same property of softening and caking of most of our Eastern coals that has militated against complete gasification in the United States. Not enough consideration is given in the development of new processes to the great differences that exist in the behavior of coals on heating. Each variety has its own peculiar characteristics that must be taken into account in the design and operation of carbonizing and gasifying equipment.

The poorly coking and non-coking coals of the Central and Western United States should be worthy of trial in complete gasification processes.

### Low-Temperature Carbonization

The gasman's business is to make gas. He would be perfectly happy with a simple, low-cost process which produces nothing but gas from the coal most available to his particular district. Single-stage complete gasification, if successfully developed, would answer this requirement. Low-temperature carbonization is the other extreme. It is a process for making smokeless solid fuel, with gas and tar as by-products. Figure 1 shows the relative yields and value of the products from high and low-temperature carbonization. The low-temperature figures apply to externally heated processes only. Table 1 gives the yields obtained in both internally and externally heated low-temperature processes and by high-temperature carbonization.

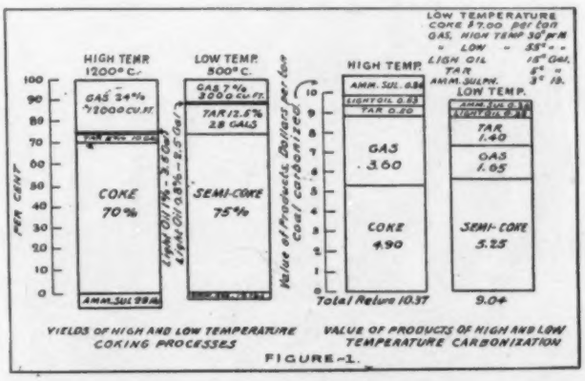


FIGURE-1.

**Table I—Approximate Comparative Yields of High and Low Temperature Carbonization Processes**

| | High-temperature carbonization | Low-temperature carbonization | |
|---|---|---|---|
| | By-product coke-oven | Externally heated retort | Internally heated retort (a) |
| Coke, per cent..... | 60-70 | 70-80 | 60-75 |
| Volatile matter in coke, per cent..... | 1-2 | 7-15 | 7-15 |
| Gas, cu. ft., ton..... | 11000-12000 | 3000-5000 | 20000-50000 |
| Calorific value of gas, B.t.u., cu. ft..... | 520-580 | 800-1000 | 150-250 |
| Tar, gal. ..... | 10-12 | 20-30 | 18-20 |
| Specific gravity of tar | 1.19 | 1.07-1.09 | 1.02-1.07 |
| Light oil for motor fuel, gal. ..... | 2.5-3.0 | 2.5-3-0 | None |
| Ammonium sulphate, lb. | 25-30 | 10-12 | 12-18 |

(a) By hot combustion gases.

It is evident from a consideration of these yields that the commercial success of low-temperature carbonization must depend on selling the solid product at an advanced price sufficiently above that of the raw fuel to cover the cost of the coal and the fixed charges; the by-products should cover the operating costs and the profit. At the present time the most hopeful field for low-temperature carbonization appears to be in the treatment of the surplus fines which accumulate at mines where coal not suitable for coke ovens is mined. The Parr and the Greene-Laucke processes are designed for such coal from the Illinois field.

### Maclaurin Process

Most of the principal development projects in low-temperature carbonization were discussed at the

[1] Strache, Hugo, Complete Gasification of Coal: Proc. First World Power Conference, London, 1924, vol. 2, pp. 819-836.

Coal Conference already mentioned, and as they may be read at your leisure in the published Proceedings[2] I will not describe them here. However, I will refer to the Maclaurin process, which was not described at the conference, but is of some interest to gas men because 5 units have been installed at the Dalmarnock Works of the Glasgow Gas Corporation

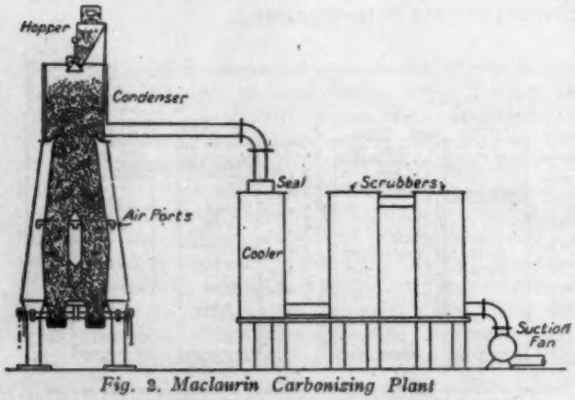



*Fig. 2. Maclaurin Carbonizing Plant*

in Scotland. The Maclaurin retort (Figure 2) is essentially a large by-product recovery gas producer in which part of the semicoke is burned to producer gas, the sensible heat of which carbonizes the descending charge of coal. The producer is square in cross section, about 45 feet high, and 8 feet wide at the widest part. The air blast is introduced about 12 feet above the discharge doors through a large number of narrow ports in opposite side walls, and also by similar ports in a dividing wall which is carried across the center of the retort at the same level. The coke is cooled in the zone below the air ports by steam injected at the discharge doors; part of this steam ascends through the coke and becomes heated and partly decomposed into water gas, then passes upward and mixes with the producer gas formed in the combustion zone. The raw coal is fed from an elevated hopper through a bell into the top of a cylindrical steel tank, 8 feet in diameter and 10 feet high, that rests on the brickwork at the top of the retort. The tank serves as a condenser for the oils and tars that drain from the side of an inner steel cylinder which dips into the well formed by a dished flange at the bottom of the tank. From the annular space between the tank and the cylinder the gases are led to tower coolers and scrubbers.

### Retort Can Be Used for Complete Gasification

The capacity of the retort is about 20 tons of coal per 24 hours. The coal should not be strongly coking, otherwise the charge will stick and not descend uniformly and the hot gases will not be distributed evenly throughout the charge. The retort can be used for complete gasification or for production of smokeless fuel; the adjustments necessary are in the regulation of the air blasts and the gas outlet valves. The operating temperatures are 750 degrees C. at the air tuyeres, 200 degrees C. at the bottom of the steel tank on the top of the brickwork, and 60 degrees to 80 degrees C in the gas offtake.

The semicoke produced is but slightly fused and of low density; it is not a high-class domestic fuel—nevertheless, the Glasgow Gas Corporation installed a battery of five producers at Dalmarnock aggregating 100 tons of coal per day at the gas plant for the purpose of supplying gas for heating vertical gas retorts and at the same time producing low-temperature coke for use as smokeless domestic fuel. The corporation expects a yield of 22,000 to 27,000 cubic feet of gas giving 240 B.t.u. per cubic foot, 12 to 17 gallons (U. S.) of dry tar oil, and 14 to 15 pounds of ammonium sulphate per short ton of coal.

During the past year this plant has operated intermittently and under some difficulties both on account of the coal strike and ironing out troubles experienced in holding the combustion and coking zones of the charge at constant levels. It is reported that the smokeless fuel does not command a ready sale at the prices necessary to cover the present cost of manufacture. This is not surprising as the Maclaurin char is a light, bulky fuel which would require frequent firing in domestic stoves.

### Summary of Recent Progress in Low-Temperature Carbonization

In summarizing the last year's progress in low-temperature carbonization it must be said that no process can yet be said to be in successful commercial operation, excepting brown coal plants in Germany; nor can it be said that success is much nearer than a year ago. Nevertheless, progress has been made in a better understanding of the great importance of the physical and chemical properties of the coal to be carbonized in relation to the process and retort design—in particular, the caking and softening properties of the coal when subjected to heat. Also, the objectives of low-temperature carbonization are more clearly defined. The trend has been in two definite directions: first, the production of a briquetted smokeless domestic fuel to be sold in competition with anthracite, or when made from cheap bituminous coal screenings to be sold in competition with high-temperature coke or screened lump bituminous coal; and secondly, the pre-carbonizing of power-plant fuel in order to recover salable by-products. Present experimental projects have one or the other of these objectives in view, and a brief description of the second is now given.

### Carbonizing Pulverized Coal—The McEwen-Runge Process

The most interesting experimental project now in progress is the McEwen-Runge process for carbonizing pulverized coal being developed by the International Combustion Engineering Corporation at the Lakeside plant of the Milwaukee Electric Railway & Light Company.

[2] For general review of various processes and their application also see Low-Temperature Carbonization of Coal, by A. C. Fieldner, Tech. Paper 396, U. S. Bureau of Mines, 1926, 46 pp.

The carbonizing unit consists of two cylindrical vertical retorts, one superimposed above the other and each approximately 40 feet high, and 6 ft. 9 in. inside diameter. These retorts are constructed of one-quarter inch steel shells lined with firebrick. Pulverized coal is showered down the upper retort where it is heated to 540 degrees F. by hot combustion products containing about 5 per cent oxygen. Under these conditions the moisture and incombustible gases are drawn out of the coal and the coking properties are destroyed so that the fine particles will not stick together. The product from the upper retort is then showered down the lower retort where it is heated to 1050 degrees F. and converted to a porous, bubble-structured semi-coke powder, by ascending preheated gases. Combustible gases, tars, and light oils are to be recovered as by-products from the second retort. The carbonized powder is said to require but little further pulverizing for use in the boiler furnaces of the power-plant.

This process goes to the ultimate extreme in rapid heat transfer to the coal and has possibilities of very high throughput in relatively low cost equipment, but the mechanical difficulties to be solved seem very great, especially in separating the fine dust from the tar vapors. It is claimed that a by-product gas of about 530 B.t.u. per cu. ft. will be obtained and can be sold to the local gas company.

Should this or a similar process for pretreating power plant fuel reach commercial success, the natural market for disposing of the gas would be the local gas company. The future central electric-power station may become an important source of purchased gas just as the metallurgical coke-oven plant of today supplies certain of our gas public utilities.

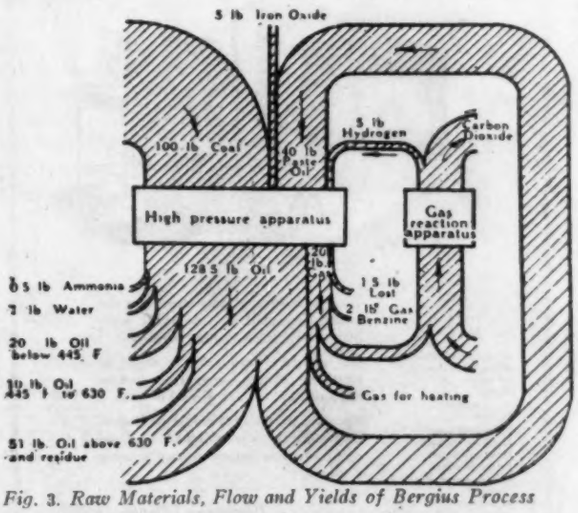



*Fig. 3. Raw Materials, Flow and Yields of Bergius Process*

## Bergius Process of Hydrogenating and Liquefying Coal

In the Bergius process, pulverized coal mixed with 40 per cent of oil (this may be oil from the process) and 5 per cent of iron oxide, is heated to 400 to 450 degrees C. in hydrogen under a pressure of 150 to 200 atmospheres. One ton of crude oil and the equivalent of 10,000 cu. ft. of 550 B.t.u. gas are obtained from 2 to 3 tons of coal. Bergius reports a test on an Upper Silesian gas-flame coal which yielded 140 gallons of refined liquid products per short ton of coal, as follows:

| Product | U. S. gallons |
|---|---|
| Motor fuel | 48 |
| Diesel engine and creosote oils | 54 |
| Lubricating oil | 16 |
| Fuel oil | 22 |
| | 140 |

One thousand pounds of bituminous coal (6% ash) plus hydrogen and iron oxide, furnish the following products:

| | Pounds |
|---|---|
| Motor Fuel | 150 |
| Fuel Oil, for internal combustion engines | 200 |
| Lubricating Oil | 60 |
| Fuel Oil, for industrial use | 80 |
| Distillation Loss | 35 |
| Gas | 235 |
| Water | 75 |
| Ammonia | 5 |
| Coke (with ash) | 240 |
| Loss | 20 |

Figure 3 illustrates the raw materials, flow, and yields of the Bergius process.

From the coke produced in the carbonizing retorts, the hydrogen needed for liquefaction is made by the steam-water gas catalytic process. The high calorific value of "Bergin" gas, said to be equivalent in therms (1 therm=100,000 B.t.u.) to 10,000 cu. ft. of 550 B.t.u. gas per ton of coal treated, is mixed with enough water gas to bring the B.t.u. of the mixture up to the same standard as the coal gas. The products of such a combination plant would be gas and oil instead of gas and coke.

In the absence of any detailed data on costs and gas yields of the Bergius process no reliable opinion can be given of the economics of such a combination. Certainly it is not possible as long as our present abundant supply of petroleum holds out. Even granting the exhaustion of petroleum, the combination would appear to require considerable flexibility of adjustment to the varying seasonal demand for gas without imposing large fixed charges for idle equipment during the off-peak season.

## Estimate of Cost of Making Bergin Oil in America

In order to furnish some idea of the economics of the Bergius process, I have made the following rough estimate of the manufacturing cost in America of a metric ton of crude Bergin oil. This estimate is based on a similar German estimate for a plant with a capacity of 40,000 metric tons of crude oil per annum, which was published in the technical section of a German newspaper in 1926. As the author was not given I can not vouch for its reliability. However, it is considered by certain German engineers,

not connected with the Bergius interests, to be a reasonable estimate. As fabrication costs are much higher in America than in Germany, I have multiplied the German investment cost by 2½ to convert to American conditions. This gives an investment of $4,000,000 in a plant to make 40,000 metric tons of oil a year.

**Table II—Cost of Making a Metric Ton of Crude Bergin Oil in America**

| | Cost | Per cent of Total |
|---|---|---|
| 1. Fixed charges; 4 units. | | |
| Interest on investment, 6% of $100..... | $ 6.00 | 11 |
| Amortization, 10 years, 10%..... | 10.00 | 18 |
| Repairs, 10% ..... | 10.00 | 18 |
| Insurance and taxes, 3%..... | 3.00 | 5 |
| | $29.00 | 52 |
| 2. Materials, energy, labor. | | |
| Coal, 2 tons at $3 per ton..... | $ 6.00 | 11 |
| Hydrogen generation from 2/3 gas yield, 20,000 cut. ft. of hydrogen at 40c..... | 8.00 | 15 |
| Use remainder of gas for process heat.. | 0.00 | .. |
| Electric power, 233 kw.-hr. at 1c..... | 2.33 | 4 |
| Labor and salaries for 2 man-days at $5... | 10.00 | 18 |
| | $26.33 | 48 |
| Total cost per metic ton or 6½ bbl. of crude oil ..... | $55.33 | 100 |
| Cost of 1 bbl. of crue oil..... | $ 8.51 | |

In this estimate it is assumed that the process gas is sufficient to furnish all the hydrogen and the process heat required, as stated by Bergius. It will be noted that the manufacturing cost of the crude oil is $8.50. If the investment cost can be reduced to one-half the figure I have taken, the cost of the crude oil would be about $6 a barrel. Obviously, the Bergius process can not be considered in this country until after the petroleum supply fails to meet the demand, and even then it is by no means certain that gas companies will find it a profitable adjunct on account of the high ratio of fixed charges to total production cost of the oil.

¤ ¤ ¤ ¤

## PULLMAN HEATED BY GAS BOILER

The most recent application of the gas-fired furnace has been developed by the Wabash Railroad to keep Pullman cars warm.

The railroad was faced with the problem of supplying heat for a car which laid over in Chicago for two hours each evening. A steam locomotive could have done the heating, but only at an exorbitant cost, and the local gas company was consulted.

A gas-fired steam boiler with automatic heat control was installed in the basement of the passenger station, and from this a pipe was carried to the tracks where the car was stopped. The gas-fired boiler now supplies steam to the Pullman for the two hours each day that heat is required, at the end of which the gas is turned off.

The installation, which is believed to be the first of its kind, is reported to be both economical and efficient.

## GAS MEN SAVE BABY

The job of installing and repairing gas mains and meters may seem a rather colorless and distasteful occupation to the layman, but there are times when the gas service man performs jobs of heroic proportions.

An instance of this sort was recorded recently in Detroit, where a two months old baby was saved from death several times by employees of the gas company and finally started on the road to health.

The baby had been suffering from bronchial pneumonia and doctors despaired of her life. Finally breathing stopped and as a last resort a call was sent out for a pulmotor. The gas company responded and two of its employees who had been trained in first aid work applied artificial resuscitation. Their efforts were successful in rekindling the tiny spark of life and several times throughout the day they were called on to repeat their life-saving work. Finally the baby began to breathe normally and is now well on the road to health.

All gas distribution men are trained in resuscitation methods as precaution against accidents in their own work.

¤ ¤ ¤ ¤

The Radiant Gas Heater is ready to serve any time
The gas heater provides clean heat the instant you need it. No effort is required other than turning a valve.
Gas service is ready, day or night, to supply a uniform, dependable fuel in any quantity, for any period of time.
Fireplace and portable model gas heaters are on display at your Gas Office. An early selection insures winter heating comfort.
Telephone: TRIangle 7500
The Brooklyn Union Gas Company

*Time Opportune To Install Heaters In New Homes*

# Factors Affecting the Possibilities and Trend of the Domestic Gas Consumption*

*Thomas F. Kennedy*
Manager New Business Department, Henry L. Doherty & Co.

THE invitation to address your association was a very pleasant one to accept. Representing as you do practically all of the gas companies of this section, and gathered as you are in this convention to discuss the management and operation of your industry, affords me an opportunity to lay before you some matters which I hope will strike you as important.

Let me make it clear at the outset that my remarks are directed towards the artificial gas industry as a whole. I have no particular locality or section in mind and I desire that my paper be construed as general rather than specific.

### A Comparison With Other Industries

The artificial gas industry of this country is in the 115th year of its existence. Serving 52,000,000 people through 11,000,000 meters and using four and one-half billions of dollars of capital. This industry is one of the oldest and largest. However, it stands alone and comparisons are not to its credit.

We have been 115 years attaching 10,000,000 cooking devices made up of ranges, cookers and hot plates, 3,500,000 water heaters, and 4,500,000 space heaters, and a few scattered industrial installations. Automobile companies have marketed between eighteen and twenty million cars in twenty years. The electrical industry has outdistanced us in about twenty-five years. The telephone, the radio, the motion picture, and even the railroad have arrived and moved swiftly to positions of dominance, while those in the gas industry tranquilly looked on. It has been content with decreases or meagre increases year after year, yet all the while there has been an opportunity to multiply even our present top output at least ten times.

### What Is Competition Doing?

Today executives of gas companies are, I believe, just beginning to realize that there is something wrong and are making ready to do something about it. Competition, meanwhile, is making gain of our lethargy. The coal man is "bucking" to hold his own, while the manufacturers of oil-burning appliances have been taking our industrial house heating and domestic business by selling appliances each year approximating $95,000,000. To electric current has gone a large amount of our industrial, cooking and waterheating business. The laundryman has taken a large amount of our washday gas load, the baker is hanging crepe on the ovens of our gas ranges through the sale of bread and pastries, while the delicatessen stores are covering the top burners of our gas ranges with dust, cobwebs and newspapers. The gas man is going to have to get into the game as it is played today, advertise, solicit, market appliances, develop new uses, capture the public attention and make the public feel its importance to their economic welfare and necessity, otherwise he may be left way behind.

### Large Volume of Gas Sales Necessary

The word "volume" rings in the ears of business today. Low cost production, low retail prices, wide distribution through concerted national appeal and sales effort is the present-day order of things. Existence on narrow limited market is in this age too hazardous to be comfortable. "To the victor goes the spoils; the sheriff takes the hindmost." Ford was not the only man to foresee the possibilities in the automobile, but he is the only one to thrice refuse a billion dollars for his business. Ford knows how to sell and to get volume.

### Rates and Modern Methods of Manufacturing

As we study the gas situation to find wherein it differs from some of the other fast developing industries, one factor stands out plainly—that of the cost of our commodity. We should, I believe, give serious consideration to changes in our rate structures, so that a lower cost per unit can be secured by our customers which would permit of their using larger amounts of our products. These changes, no doubt, can be brought about through the use of more modern methods of manufacture together with large increased sales. The industry should constantly be ready to abandon old equipment and to adopt each new step looking towards greater efficiency and lower manufacturing costs. We should set our sights to annual sales of 300,000 cubic feet of gas per residential customer.

To secure this large yearly consumption, it will be necessary to design a rate that will be attractive and one that will in a way protect your present domestic cooking and water-heating revenues, and at the same time will permit the taking on of this large additional volume of added load. This can be done through a system of charges patterned after the Three Part Rate or the lowering of the follow-on charges on the present block or step systems, so that the rates charged will be competitive with other fuels.

The above yearly estimated consumption can, I believe, be added through the sale of gas for house heating and cooling, water-heating, refrigeration, etc. On the assumption that we secure a yearly consumption of the above figure and with our margins of net profits cut to as low as 10 cents per

*Read before Southern Gas Association Convention, Atlanta, Ga., April 19-22, 1927.

thousand, we will then receive a net per year per customer of $30, this figure equaling our present yearly gross revenue from our domestic customers.

So it isn't so hard to visualize the possibilities with lower costs of production.

With reference to rates, I quote the following: "The High Rates Handicap," by Floyd W. Parsons, in the March 5th issue of the Gas Age Record:

"Recent editorials have brought a wide response from members of the gas fraternity, and the common note sounded by nearly every one is the danger that threatens us from the continuance of present high rates. It is perfectly obvious from all the facts at hand that gas must be sold to large consumers at a much lower price, or we will fail lamentably in realizing our expectations of a great expansion in the market for our fuel. Our competitors in the electrical field have clearly marked out the premises on which the battle for the control of the heating business shall be fought to a finish.

"The one and only way to meet this situation is to get rates down to a point that will prove attractive to large users of heat. It is absurd to assume that the people of any community will forbid one utility from following merchandising practices that another utility in the same town uses daily. We have also got to get hold of the idea that our profits must come from selling larger quantities of gas at a lower margin of profit. The most profitable organizations in America during the last decade have been the chain stores, which stake their entire future on the maintenance of a huge turnover. Our tardiness of effort in adjusting rates is something to weep about."

As a further illustration, on January 3rd, 1927, Ralph Pulitzer, owner of the New York World, cut the price of his paper from 3 to 2 cents. In his published statement is the following significant remark:

"To the New York World, a stationary circulation is a stagnant circulation, and the half million dollars per year which the extra cent brings in cannot begin to pay even the risk of stagnation."

### Larger and Better Selling Organizations

The reduction in rates and the building of modern gas plants will not alone suffice. Additional load is slow to come on our mains of its own free will and accord. A fact which some companies have discovered recently as indicated in many of the annual reports of gas companies which are now being published. Through the reading of these you will find many useful comments on this subject. After the introduction of changes in rate structures the gas industry must have the ability to bring its sales up at a rapid rate of growth each succeeding year. To quote from the Gas Age-Record of July 3, 1926, "The gas industry must become selling minded." At our present rate of progress it will take the industry a long period of years to reach the goal of merchandising ability which certain other large industries have already reached. We cannot afford to wait.

Gas companies must build bigger and better business getting organizations. The very highest type of sales management and personnel must be secured and paid for. Their opinions should be reckoned with in formulating all company policies and practices. The selling frame of mind should dominate the entire industry. Scattered efforts throughout the country of variable intensity and effectiveness will not accomplish the desired results. There must be concerted action from all points. Mass attack is resistless while "sniping" may be lost in the roar of the enemy's cannon.

Within each local company selling must be unified. Many gas properties today operate separate appliance, industrial, home service, coke, public relations, and securities departments, each selfishly striving for particular favor in the eyes of the management. This process is not only inefficient and inexpensive, but is decidedly distasteful and annoying to the public. Whatever the public desires to purchase from the utility from appliances to securities should be handled by one real sales department.

Salesmanship is a distinctive art. Few who are not salesmen understand its methods and its reasoning. The management of the gas industry largely rests among men whose training has been that of engineering, accounting and finance. Placement of our selling on the plane that it deserves and which our situation commands, means that latitude, tolerance and confidence from the management must be exercised to the last degree.

### The Sales Department an Important Part of Each Utility

In support of my plea to make your New Business department an integral part of your entire company operations, I want to quote Mr. Philip Cabot of the School of Business of Harvard University:

In discussing the future of the electrical industry in the January 14th issue of the Annalist he says anent the type of public utility executive we may expect to find in coming years:

"As in all industries in changing times, the character of the problems confronting the electric power companies is changing, and we may accordingly expect to see corresponding changes in executive organization. In the past the leaders of this industry have been engineers, because the major problems were primarily engineering; and we owe these men a debt which we are never likely to pay. But today the major problems are economic, and the major one is how to market the huge increase in production for which the industry is now equipped. For this work men of the merchant type are needed. Few such men now sit in the inner circle of executive management, but they will soon be found there."

The Gas Age-Record of January 22, in commenting on Professor Cabot's statement, says: "Philip Cabot has the background of actual managerial experience. He is not speaking from the theoretical viewpoint of the college professor. While the above is directed at the electrical industry, it applies as well to the gas industry. The problems of the future are more economic than engineering. This does not mean that the engineer has finished his job, it merely means that the merchant is needed to sell the service that the engineer will provide both in the production and utilization department."

### Sales Expense to Be Reckoned Over a Period of Years

Costs of sales efforts must be reckoned from results over a long period. For illustration, a New Business expense of $1.00 for each dollar of increased revenue received is but five cents when spread over a period of twenty years. Mr. Hawkins, formerly sales manager of the Ford Motor Car Company, testifying in Washington recently, described how the most wonderful sales organization ever known was built. In following his testimony, not once was the cost of this wonderful selling organization ever mentioned. I do recall this statement made by Mr. Hawkins: "Ford's 7,000 dealers and experts constitute the most valuable franchise in this country." If we build our sales organization on a broad business basis and have less of a near-sighted eye on the costs, the results secured will dwarf our fondest expectations.

### Selling Not on Trial

It is well to remember this: Selling is not on trial, but your employment and management of it is. It cannot and will not fail if the industry will permit of its unfettered development free from the questionings and bickerings of those who do not understand it.

Wise men do not deal in abstracts. Experts waste little time trying to sell ideas, theories and hokum, for they know the sales that count in the dividend column are those of definite objects. The tangible articles to be sold by us gas men to return net earnings and dividends are appliances. Our product is useless and without value except when it is put to useful work through stoves, heaters and furnaces. To sell more gas, more appliances must be installed in homes and factories. Our sales will mount only as more gas consuming apparatus is used on the mains of our companies.

Granting that the industry in all its branches will soon provide itself with the highest type of selling ability, let us consider the means which have been evolved for marketing goods quickly, efficiently and economically and then apply them to the gas business.

### Sales by Personal Solicitation

First comes "Personal Solicitation," by house-to-house representatives of a pleasing appearance with a knowledge of the consumers' needs and wants, the company's ambitions and the incentive through adequate and attractive compensation to bring them both together. An official of the Jewel Tea Company, speaking recently before the American Managers' Association, said: "Personal solicitation has built for us a reliable and even market for our product through both good and bad times. After twenty-seven years of its use and then by comparison, we find it best meets the American insistence for a convenient way of buying."

Gas companies should have trained representatives allotted to a certain given number of customers who should constantly be in close contact with their customers, settling complaints, soothing out sore points, adjusting appliances where possible and to see that such appliances are always kept in the best working condition. Through confidence and understanding, such gas company representatives will sell appliances and, at the same time, assist in educating the public to use and enjoy them.

### Free Trial Installations

Demonstration by actual use is 80 per cent of each sale made. By installing our appliances in the homes of our customers on free trial, without obligation, stint or cost, we will make a big stride ahead. Complete installation for example of a range, storage water heater, incinerator, auxiliary heaters and a gas-fired furnace purely on trial should be a standard policy. A study of these trial offers, scattered all over the country, shows that 70 to 80 per cent of such installations result in sales. The method now in vogue, whereby the customer purchases before installation, means that he in a sense takes the chance. Consequently, he does much hesitating and much resisting of our attempts to sell him. With a free trial method the gas company takes the small end of the gamble, the customer buys after he has experienced better meals, real hot water service or a perfectly heated home, and his objection and resistance to purchasing are nil.

### Extending Time Payments

Ranking on a par with personal solicitation and the free-trial method, are time payments which count as a tremendous selling force. Any lingering doubt as to its over-all advisability have been swamped under a deluge of advantages to be gained by its use both by the seller and purchaser. The Wall Street Journal of January 1st, this year, told of the results of a survey taken by obtaining the candid opinions of bankers throughout the country, which was overwhelmingly in favor of time payments.

Gas companies, to a small degree, have used the installment payment plan. By a small degree, I mean the length of time allowed together with the size of payments offered. In general, the extent of the time period offered has been between six months and one year. Though this has been of great assistance in the development of appliance sales, it has limited the customer to the purchase of but one appliance at a time.

I believe that the time payment period covering the sale of appliances should be somewhat lengthened out. I believe we should give consideration to making the limit five years instead of one, with the payments per month reduced to one-fifth. With an attractive time payment plan of this kind our customers can be induced to furnish their homes with a full complement of appliances at the beginning. The utility company will benefit by the revenue from a

completely gasified home from the start. The accrual looms large when compared to the tedious process in use today. The gas industry has lost millions of dollars by compelling each customer to develop his own ability to consume gas by the painful method of evolution; for cooking purposes, the hot plate—cooker—cabinet style range. For heating, water from tea kettle—tank heaters—storage system and for house heating we have not as yet dented the field. As proof of this, let me repeat, there are ten ranges to three and one-half water heaters to four and one-half room heaters to practically zero furnaces.

### Importance of House Heating With Gas

With sales organization, rates, prices, terms and liberal policies established, let us look over the appliances to be sold to select those which will build load the most quickly. The house heating furnace comes first. Its manufacturers, through their research and study, have brought it to a degree of perfection which eliminates any fear as to its workability that may have existed heretofore. With rates low enough, free trials, and long term payments, its sale is comparatively easy. The public is anxious to drop the coal shoveling and ash hauling. They want the perfect carefree automatic heating service that gas gives so much better than any other fuel.

### House Cooling

Now with the advent of the gas-fired refrigerator, I believe that it is going to be possible to open up an entirely new field for the sale of gas in the home, through the cooling of houses during the summer season in connection with warm air heating plants, and I believe that it will also be possible to work out plans to equip other systems as well. The use of gas for this purpose would be approximately one-third of the gas required to heat the home and would assist materially in straightening out the load curves during the summer months, especially in those cases where additional manufacturing capacity has been added to take care of househeating requirements during the heating season. Here in the South, where the summers are long and warm, it would seem that a scheme of this kind would be particularly desirable and would add an additional load equivalent to 50 or 60 per cent of that required to heat the same house.

The possibilities of refrigeration with gas have been talked of for many years in the past and we have now only arrived where a number of the gas companies are taking hold of this appliance, after a long and hard struggle by the manufacturer to perfect this appliance. In the meantime we have forfeited probably millions of dollars by such delay, and I hope that such will not be the case in bringing about the development of the idea of "house cooling" with gas. The development of this idea from a theory to a fact and the making of it a commercial success seems to me the duty of those entrusted with the responsibility of adding business to the mains of our companies.

I believe that we should endeavor to work this out through our own engineers and engineers of manufacturing companies and make a few practical installations in homes of customers, making the customary study after and during the working period. All of this should be considered as practical laboratory experiments, for which liberal appropriations should be made.

With this idea brought to a successful conclusion I would hesitate to predict the ultimate return to gas companies in gross and net earnings as well as customer appreciation for providing another worthwhile home convenience.

In connection with the use of gas for "house cooling," I quote an editorial as published in the March 5th issue of American Gas Journal. In part the editorial reads:

"Impartial authorities have agreed that gas refrigeration possesses not a few advantages over electric refrigeration, and it is patent that we shall witness, from now on, the installation of many gas-fired units in homes and various institutions. But are we going to sit at this juncture and indulge in a deal of self-adulation? Are we sufficiently far-seeing and game enough to invest a relatively few dollars by way of research in this our newest application of gas? Will not a trifle of vision enable us to dominate the situation in so far as "House-Cooling" is concerned? And, make no mistake, we are fast approaching the stage where homes will be cooled in the humid days of summer by means of some mechanical or power impelled apparatus.

"Are any of our engineers prepared to state how much cooling can be accomplished in the average home for the sum of five dollars per month? Or if this amount would furnish an insignificant quantity of cooling, what sum would take care of the situation? If this latter figure were not found to be prohibitive, how large would the field be, and how would the unit be planned? Would it be a combination unit bringing in the dual function of cooling the home and preserving food?

"Is the problem worth tackling or shall we wait until some other agency blazes the trail? In short, is opportunity beating a vigorous tattoo on our front door?"

### Those Alarming Peaks

In the minds of some gas men exists apprehension as to the result of rapid addition of house heating loads. The old bugaboo "peak" raises its head, though in practice diversity has knocked it down many times in the past. Admitting that it does create peak and higher ones than we have ever known thus far, aren't remedies, such as district holders, high pressure distribution and storage, quite acceptable, though little used at present. To avoid peaks by holding back business and revenue is as futile as prohibition enforcement.

With a further reference to peaks, let us take the situation with one of the largest and best operated railroad systems in this country. During 1926 the New York Central Railroad carried one-half of its passengers between New York and Chicago on its

crack train, the Twentieth Century. To meet this peak of travel, the Twentieth Century is operated in from four to ten sections daily as the traffic demands. You can always get a reservation. The Twentieth Century trains of this railroad earned $10,500,000 during 1926. The New York, New Haven and Hartford Railroad's premier train, No. 82, operates between New York and Boston. During the Christmas rush, it is impossible to get reservations on this train a week in advance. The waiting list averages between 80 and 100 persons. Nothing has been done to meet this demand, which may explain why the stock of the New York Central sells at a market price of approximately $100 in excess of the stock of the New Haven Railroad.

The New York Yankees pay "Babe Ruth" $70,000 per year to have a peak in home runs and batting averages. There are peaks in all classes of business, in all walks of life, in time and space and matter, in work, in recreation and in love—why not the gas business?

After house heating and usually with it comes automatic water heating, auxiliary heating and in the back-ground is the potent dark horse, industrial uses, whose possibilities are limitless and whose opportunities can be cashed in on by using proper sales methods.

### The Master Meter Plan

In the large cities we see a rapid tendency toward apartment house buildings. This process is usually one that cuts the consumption of gas and revenues per customer very severely. A way has been found to restore and invariably increase both, and that is the Master Meter practice.

Through the Master Meter Plan, gas is sold to the apartment house owner at reduced or wholesale rates. This makes it possible for him to use gas for water and building heating which has formerly been done with coal. The gas is furnished to the tenants gratis, the cost being reckoned in the rent. With the elimination of much piping, banks of meters and many accounts, both the customer, owner and utility profit. The customer, finding no restraint, no monthly bills, uses gas freely and at will. All of which tends to make our commodity universally popular. A recent example of the Master Meter Plan comes from an apartment house in Denver, Colo., having 41 apartments. Before the installation of the Master Meter Plan, the average monthly gas consumption per meter was 800 cubic feet. After the introduction of the Master Meter the average use per month increased to 1,560 cubic feet per customer, or practically double the consumption used per month previous to the installation of the Master Meter. In addition to the increased monthly consumption of the apartment house tenants, the building coal fired water heater was converted to gas, which brought an average monthly consumption of 4,300 cubic feet per customer. The total cubic foot sales per customer in this apartment house building now averages 5,860 cubic feet per month. This increase of approximately seven times was made possible through the Master Meter Plan, on which the gas was sold on the Doherty Three Part Rate. A rate of this type is necessary to further the securing of increased consumption to those customers having a good load factor and permitting the efficient and economical use of gas.

### Conclusion

In summing up our needs, they are lower rates and better selling, particularly of appliances through free trial, personal solicitation and liberal time payments. Our policies must keep pace with the ever shifting conditions and the steadily rising standards of living.

The public demands better conveniences, to give them healthier lives, happier homes, more time for recreation and education. The gas industry by constant application to its job can give their customers and the public these fine things and will receive their reward.

¤ ¤ ¤ ¤

The Ultimate Industrial Fuel
Gas-Fired Boilers for Steam and Hot Water.
Gas fuel eliminates smoke, ashes, dust and dirt which means a clean plant.
In addition Gas possesses all the desirable factors necessary to obtain a constant quality product.
It permits an exact control of temperature which can be steadily maintained as long as desired.
Neither valuable storage space nor advance expenditures are required as in other fuels.
At your request expert Industrial Engineers will gladly make a survey of your heating requirements.
Telephone: TRIangle 7500
The Brooklyn Union Gas Company

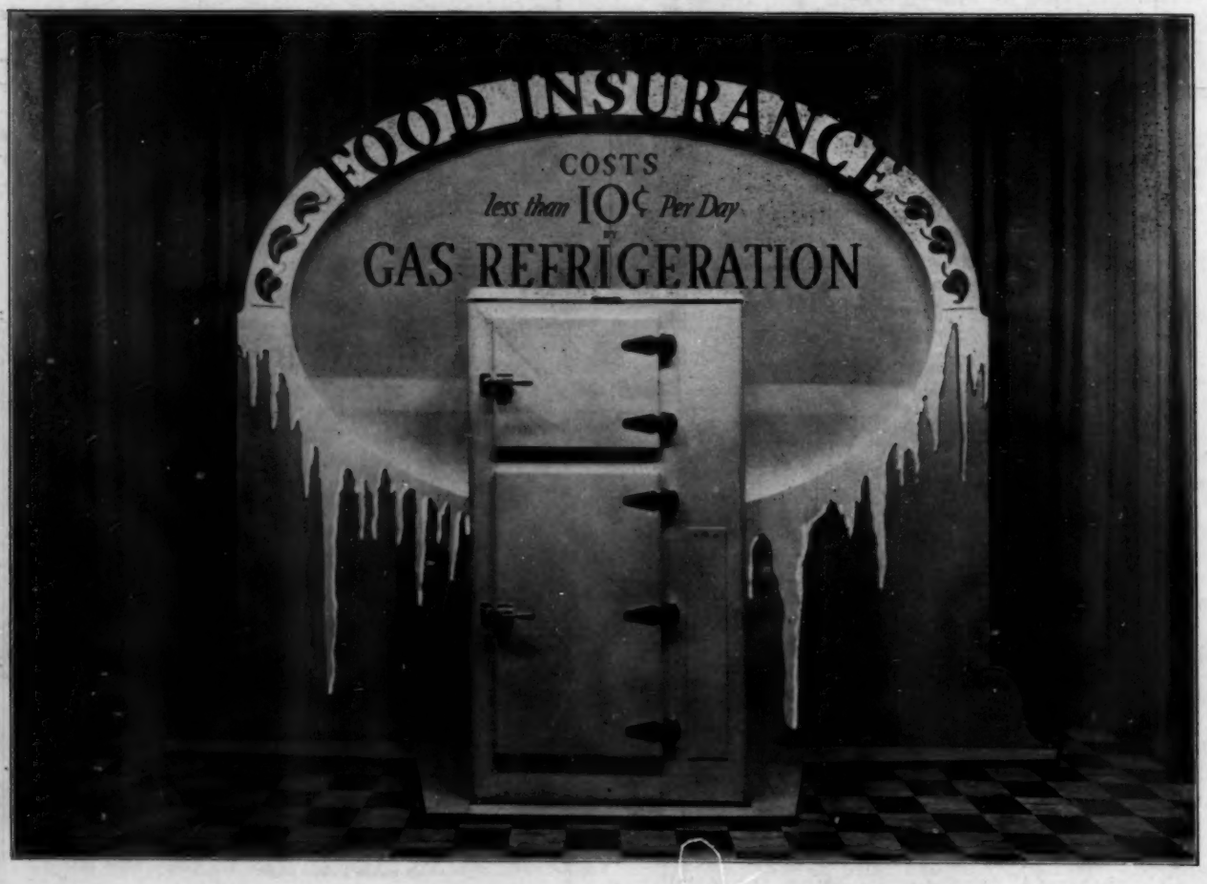
*The Ultimate Industrial Fuel*

# WINDOW DISPLAY ADVERTISING

## That sells more gas to pleased customers

*Ray Martin*

Display Manager, Consolidated Gas Company of New York




In the merchandising of Refrigeration gas companies have unusual opportunities to avoid the errors in psychology of some of our electrical brethren.

Prominent among these errors, in the judgment of the writer, is the way in which the electrical industry has displayed its refrigerators in windows. Almost invariably the electric box has been shown in an environment approximating the north pole. If this is good psychology the gas industry should place the gas furnace in a desert setting. But here we would have none of the all important element—contrast.

The logical way to stimulate interest in refrigeration without ice—gas or electric—is by placing the box in a torrid or tropical zone. We then approximate the conditions under which the unit will operate. In addition, the wall insulation of our gas refrigerator is an important point best brought out by associating heat, portrayed by warm colors, with the box. By the intelligent use of color we intimate that outside heat cannot penetrate this newest arrival in the gas family.

The color scheme of the window display reproduced above consists of graded stripes of orange and red in the recessed oval. The lower portion is blue, and the platform a gray of the same tone. These latter two cold colors are used to help accentuate the strong warm ones.

# As The Journal Views It

## GAS EDUCATION FOR THE CHILD

For the past ten years or so there has been in evidence an educational movement for the masses of wage earners that has been altogether too tabloid and predigested in its nature. The road to learning has indeed been made royal. Despite this fatuous cramming of the wrong type of education into craniums that were never originally designed to accommodate the particular subject, there crop out at intervals educational efforts of genuine merit. We are of the opinion that the work the Iowa Committee on Public Utility Information is doing among the school children can well be included in such a category.

The original idea in educating the public anent the subject of gas was to direct the message almost entirely to the adult portion of the population. As a generally accepted fact, the average adult is in none too receptive a frame of mind to absorb any great amount of education. His brain is not burdened with any excess of plasticity and whatever he does manage to mentally digest must be fed to him in a painless manner.

Further, the adult is generally laggard in exercising his imagination and often loses the human interest appeal, which is what the gas industry must stress in getting its story across.

Through all his years of schooling, at least up to the time of entering college, the child is possessed of an imagination that is tireless in its rovings into the realm of fancy and, what is most important, can be harnessed to the end that it will perform some lasting good.

As Mr. Carmichael indicates in his article, most children have been wont to look upon a gas plant as being a somewhat smelly place where the workers easily manage to become intolerably filthy. To them such dirt means nothing more nor less than dirt; something, perhaps, to well be lost sight of in their everyday routine of thinking. With the proper education, however, such soiling of the hands and face can only come to represent to them a badge, as it were, of service of the highest sort to the community; work that demands and generally gets real red-blooded individuals to carry it out. In short, it is concerned with the stressing of the human interest side of our industry.

It is true that our efforts, after a fashion, should also include some education of the adult, but it would seem that the education the latter is most interested in is that which is concerned with how much dividend his utility stock is likely to pay.

And so it would appear that if we can take the youngsters and plant the thought in their minds that ours is an interesting, human sort of business, we will have done a very mutually beneficial thing.

☼ ☼ ☼ ☼

## PRODUCTION CONFERENCE

The fact that upwards of three hundred gas engineers from various sections of the country attended the first Production Conference at Detroit augurs well for this phase of association activities. Further, the interest shown by those in attendance, as evidenced by the enthusiastic and to-the-point discussion, should assure us that the manufacturing problems of the industry will be solved in a wholly satisfactory manner.

Under the plan by which the Conference was conducted it is not permitted that verbatim report be given any portion of the proceedings; nor may those participating in the discussion be quoted by name, even indirectly. For this reason it is not feasible to give as full a report, which incidentally will appear in our June 18th issue, as we should like. It is necessary that such readers bear this in mind and plan to attend subsequent gatherings in person if they are to gain the maximum from the valuable proceedings.

That such attendance is well worth while, everyone who was at Detroit well knows. Those who missed that occasion cannot well afford to miss later similar gatherings. The outstanding success of the first Conference makes it certain that this will be a regular part of the association program of technical work in the years to come.

American Gas Journal congratulates the association, and particularly the chairmen of the two committees responsible, upon the success of this first meeting. Our only regret is that an even larger number of technical men from the industry could not have been present to reap the full benefits from the proceedings.

INDUSTRIAL GAS LESSONS

IF IT'S DONE WITH HEAT YOU CAN DO IT BETTER WITH GAS

# Lesson No. 173

# Blue Water Gas

### The Raw Materials

Before leaving the subject of blue gas it is necessary to consider the fuels that are used in the process. The fuel for making blue gas was either anthracite coal or coke up to within rather recent years. Within the past ten years another fuel has been added, and that is bituminous coal or soft coal. There were certain technical difficulties which surrounded the use of soft coal for blue gas manufacture, but these have been overcome, and it appears that in the near future it will be possible to use most any solid fuel for this process, even such products as lignite, wood waste, and the like.

The general characteristics of anthracite coal have been discussed in previous lessons, and it is therefore not necessary to go into their description here. It is of course understandable that the anthracite coal, to be useful for the manufacture of blue gas, must contain as little ash as possible. Broken or egg size of coal is used in the blue gas process and the ash content is approximately ten per cent. There is no question but that anthracite of the proper qualities and of not too great cost is one of the best fuels for the manufacture of blue gas. Within recent years there have been serious difficulties surrounding the use of anthracite coal by the gas industry, due particularly to the advancing price, less careful preparation of the coal, higher ash content and loss of dependability of supply due to the strikes.

### Coke

Coke is also an important blue water gas fuel. In general its ash content and characteristics are about the same as those of hard coal. It is understandable that this means that the type of coal, which is used in making the coke, should be carefully selected so that coke of the proper properties is obtained. The size of the coke is also important and it should be free from fines.

Within recent years considerable attention has been paid to the characteristics of the coke and its suitability for blue gas manufacture, but in spite of the numerous investigations and researches that have been carried out in this matter, no really conclusive results have been obtained which can be directly applied to blue gas making conditions. Thus, the reactivity of coke has received much attention, and it has been proven to be of considerable importance in determining the suitability of coke for use in the blast furnace. It has also been indicated that there is some relationship between the reactivity of coke and its gas making properties. The effect of the ingredients of the ash has also received consideration, and it has been pointed out that certain of the ash ingredients may well have catalytic properties. But it is not at all certain what these are and how they influence the reaction between the carbon of the coke and steam to form blue gas. The subject is a very interesting one and is receiving attention and in the future it may be expected that some conclusive results will eventually be uncovered.

### Bituminous Coal

The use of bituminous coal in the blue gas process is a direct outcome of the war, for during the war it was found necessary to find some other fuel than coke, whose use had been prohibited in Illinois for gas making. The advantages of bituminous coals for gas making purposes lie mainly in their cheapness and in the fact that they are found widely distributed throughout the country.

There are, however, difficulties in their use, such as the trouble encountered in keeping the fire in good condition, reduced capacity of the generator, stopping up of the checkerbrick in the carburettor and superheater in the case of carburetted water gas manufacture, and the smoke which is caused by the incomplete combustion of the tarry volatile matters from the coal. Method has, however, been devised for overcoming these difficulties and it is due to the effectiveness of these methods that it has become practical to use soft coals for the manufacture of blue water and carburetted blue gas or water gas as well.

# Hazards from Fire

## Tests made by the research laboratory to prove appliance is free from fire hazards

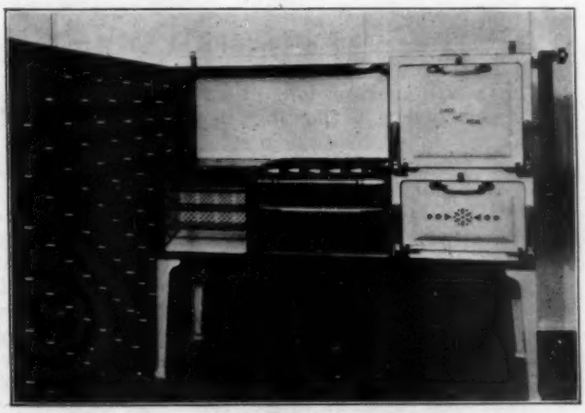
*I. V. Brumbaugh*

Research Laboratory, American Stove Co.

NO ONE wishes to own or purchase an appliance that is likely at any time to cause a fire in the building in which it is used, or to set fire to the user. Neither do manufacturers wish to build appliances that cannot be safely used under all conditions for which they are intended.

**One of the divisions** of this stove company built the new appliance shown in the accompanying photograph. The radiant heater portion of the appliance, which was an entirely new application, was designed for the purpose of heating the kitchen. The remainder of the appliance was standard in all respects.

The company had never manufactured a kitchen heater of this type in combination with a gas range. Before the appliance was offered for sale the research laboratory of the company made a number of tests, herein described, to assure the company that it was safely made.



*The Back Wall and Side Wall Fire Test of the Research Laboratory*

### Safe Distance From Wall

It is a well-known rule among plumbers and gasfitters throughout the entire United States, when installing "safely designed" appliances, not to place them closer than six inches from a back wall or six inches from a side wall in order that there will be no chance of causing a fire. Fire underwriters' laboratories, and other testing laboratories, consider an appliance safely designed when the temperature rise near the appliance does not exceed the room temperature as follows:

70 degrees F. rise under the heater.

90 degrees F. rise in front of heater with carpet on floor.

90 degrees F. rise on side wall in front of front line of heater.

70 degrees F. rise on side wall behind front line of heater.

70 degrees on back wall.

The accompanying photograph shows the appliance placed six inches from the side wall and six inches from the back wall. Note the bulbs of the thermometers which extend through the side wall. The thermometers are systematically spaced six inches apart.

It will be observed that the walls are painted black. This was done so as to obtain the greatest possible temperature rise. Black surfaces absorb more heat than any other color.

The heater was operated until the maximum temperatures became constant. At no place did the temperature rise approach the allowable limit. The greatest temperature rise was only 39 degrees F., and occurred on the side wall in front of the front line of the heater.

In view of these facts the conclusion was reached that the radiant heater could not possibly cause a fire by overheating that part of the kitchen adjacent to the heater.

### Tests of Hazard from Setting Clothing on Fire

The radiant heat rays that emanate from the radiants of this heater are quite intense. The question arose, "Can a person stand near the radiant heater when using the cooking top of the appliance without the possibility of a hazard from setting clothing on fire?"

An object was draped to correspond to a woman's dress and placed in front of the heater.

In the first test "cheese cloth" was used, because it was believed that a thin and loosely woven fabric would be the most easily ignited of wearing apparel. This was found not to be true.

The object was placed so close to the heater that the cheese cloth touched the guard. In fifteen minutes the cloth showed no signs of scorching. The thermometer indicated 360 degrees F.

A very closely woven and fairly heavy weight of cloth was then placed over the object. At six inches from the guard the temperature was 300 degrees F., and the cloth failed to show any signs of scorching in ten minutes.

### Cloth Touching Guard

The object was moved forward so that the closely woven cloth touched the guard. At this position the cloth became a dark brown in five minutes. There were no signs of a flame. The thermometer showed 390 degrees F.

A piece of this same closely woven cloth folded into four layers was then hung over the guard. In fifteen minutes the cloth had failed to show any signs of a blaze. The layer of the cloth next to the radiants was scorched almost black.

In view of these tests it is believed there is not the remotest possibility of the clothing of a person being set on fire by the kitchen heater. It is further believed that no one would remain close enough to the heater for a long enough period of time to even cause the clothing to scorch. It would be too uncomfortable to remain long enough for this to happen.

### Toasting of Bread Test

Four slices of bread were held in a rack which was supported by the guard in front of the heater.

It required only one minute and thirty seconds to toast either side of the bread. All four slices of bread were toasted alike. This test showed that the radiant heat from the heater can be utilized as a most excellent and rapid toaster of bread.

### Tests for Completeness of Combustion

The products of combustion from this heater were tested for carbon monoxide. The heater was operated at minimum rate (14,000 B.t.u. per hour), normal rate (20,000 B.t.u. per hour), and maximum rate (24,000 B.t.u. per hour).

Analyses of the flue gases showed that only minute traces of carbon monoxide were produced. Thus the heater was also highly satisfactory from the combustion viewpoint.

### Test of Hazard From Setting Clothing on Fire

Both loosely woven and closely woven cloths failed to show any signs of igniting in fifteen minute tests.

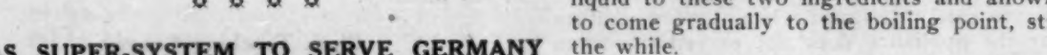
## REPUBLICS IN SOUTH AMERICA CLAIM GAS SERVICE IS NEEDED

Proof that gas and electricity are both as necessary for the development of industrial and home life in any community, and that one will not necessarily supersede the other, has been secured by a survey of the Republics of Colombia, Bolivia, Ecuador, and Venezuela, according to the American Gas Association. Each of these South American republics is richly endowed with electricity, but confesses to the incompleteness of industrial, commercial, and communal life because of the absence of gas.

Senor Jose Medina, commercial attache, Colombian legation, London, looks to gas as a means of national development of his country. The introduction of gas would mean the opening up of the coal mines and the consequent extension of railways between the coal fields and big towns.

Feeling that for certain purposes gas would be appreciated and supported, he says: "The municipal council of Bogota is open to receive proposals for the installation of gas works for the city and district. They would give the same liberal support they have given the enterprises in electricity, water and telephones."

The consul-general in London for Bolivia says that gas would have every encouragement on the part of the government and the administrators of the large centers of population, as there is keen desire to improve the country in every way possible.



## GAS SUPER-SYSTEM TO SERVE GERMANY FROM RUHR PLANTS

A gas distribution system having 1,700 miles of mains is to be constructed in Germany to carry gas from the coke plants of the Ruhr district to various parts of the country.

Nearly five hundred billion cubic feet of gas is produced yearly by these plants, and will be made available by the projected system of mains to Berlin, Leipzic, Munich, Cologne, Mannheim, Stuttgart and other cities.

The longest single main will be that from the Ruhr to Berlin, a distance of 285 miles.

The advantages of long distance distribution of gas, particularly in making it available to small towns and villages, has been recognized in this country and is being studied by engineers, according to a recent report by the American Gas Association.

New York, which heads all other States in the use of gas, already has inter-connected gas distribution systems comparable to electric utility systems. At Troy the plant of the Hudson Valley Coke and Products Co. serves Troy, Albany, Schenectady, Cohoes, Rensselaer and Watervliet. At Geneva the plant of the Empire Coke Co. serves Geneva, Auburn, Newark, Palmyra and numerous smaller communities, while the gas mains of this system cross three counties. In the western part of the State mixed manufactured and natural gas is piped for many miles to serve groups of communities.

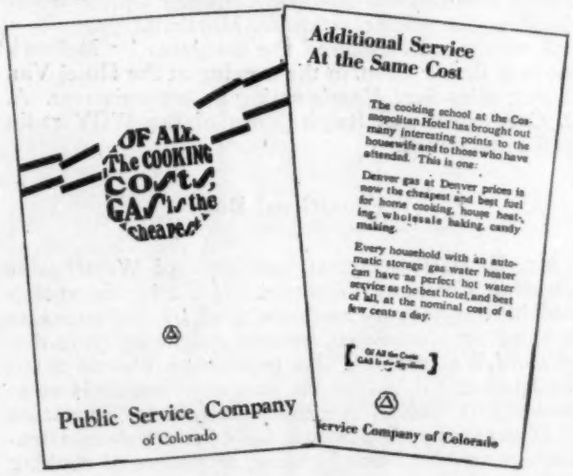
## SMOOTH SAUCES

Gravies or sauces thickened by pouring hot liquid on fat and flour blended over the fire are apt to lump more quickly than sauces made by adding cold liquid to these two ingredients and allowing them to come gradually to the boiling point, stirring all the while.

If inconvenient to cool the liquid slightly before adding it to the cooked thickening, simply take the pan containing the latter from the fire and allow it to cool for a minute. Add the liquid, return to the fire and stir to a smooth creaminess.—Providence Gas Company.

## GAS ADVERTISEMENTS DURING COOKING SCHOOL SESSIONS

While the Denver Post and the Rocky Mountain News of Denver were conducting a cooking school the Public Service Company of Colorado used the newspaper advertisements shown herewith.


OF ALL
The COOKING
Costs
GAS is the
Cheapest
Public Service Company
of Colorado
Additional Service
At the Same Cost
The cooking school at the Cosmopolitan Hotel has brought out many interesting points to the housewife and to those who have attended. This is one:
Denver gas at Denver prices is now the cheapest and best fuel for home cooking, house heating, wholesale baking, candy making.
Every household with an automatic storage gas water heater can have as perfect hot water service as the best hotel, and best of all, at the nominal cost of a few cents a day.
ervice Company of Colorado

☼ ☼ ☼ ☼

## BROOKLYN UNION HOME SERVICE ACTIVITIES

The Home Service Division classes at Williamsburgh recently thought they were in Louisiana while spicy Creole dishes were being prepared. The menu consisted of Louisiana shrimp with rice, Creole beans and Creole new potatoes.

Special dishes for Decoration Day were presented at Newtown. Buttered spinach, baked French fried potatoes, stuffed peppers, glazed beets and lily cake was served to 150 women. A great many new members have joined the ranks during the past few weeks.

The Remsen Street scouts recently held the last meeting of their course. This lesson featured the cooking of meats. To give a festive atmosphere Home Service fudge was served to the boys. Three boxes were given to the holders of the lucky numbers.

The concluding lesson of the Springfield course has been presented. That most popular of all demonstrations—pastry and pie—attracted the largest audience of the course. The 47 women who had attended all six lessons were permitted to draw prizes from a huge grab bag.

☼ ☼ ☼ ☼

## ANNUAL MEETING OF WOMAN'S SECTION, EMPIRE STATE GAS AND ELECTRIC ASSOCIATION

Edith Yeager

THE annual meeting of the Woman's Section of the Empire State Gas and Electric Association May 26 and 27 at the Hotel Van Curler, Schenectady, N. Y., was unusually interesting because of the varied subjects taken care of by the speakers.

Miss Sara Harris, assistant secretary of the Utica Gas and Electric Company, as chairman of the Woman's Section, called the meeting to order.

Mr. Otto Snyder, general manager, Adirondack Power and Light Corporation, Schenectady, gave a short address of welcome to the audience of nearly 300 that was generously applauded. Mr. Snyder expressed his interest in the activities of women and his willingness to help in the educational work which they are carrying on.

Mrs. Hazel T. Somerville, of the Mohawk Hudson Power Corporation, Albany, outlined the activities of the women for the year, of that company and various other small companies that make up the district—Cohoes Power and Light Corporation, Eastern New York Utilities Corporation, Municipal Gas Company of Albany. These companies combined employ less than 75 women, yet they have done really telling work.

### Talks by Officials

Perhaps one of the most conspicuous features of the work, as Mrs. Somerville outlined, was a series of talks given each month by officials and department heads on different aspects of the company's business. On various occasions during the year the women employees were asked to send in to their chairman a list of questions which had been asked from time to time by the public, or which had arisen in their own minds, pertaining to the company's business. The result of this request was an interesting reflection of the public attitude. All questions were answered by one competent to do so.

Miss Helen Smith, of the Rochester Gas and Electric Company, briefly outlined the work of the women of that company. Miss Smith said that since September, 1926, and including April, 1927, there had been 23 talks on gas given to domestic science students in high schools and normal training schools, to women in the home bureaus and farm bureaus and church organizations.

Miss Catherine E. Agan reported the classes held by the Syracuse Lighting Company in psychology have proved most interesting and helpful.

Miss Helen E. Seiffert, of Westchester Lighting Company, Yonkers, N. Y., outlined the work of the Home Service Division of the Lighting Company from May 1, 1926, to May 1, 1927.

**Lecture Demonstrations Operating from General Office**

| | Attendance |
|---|---|
| Women's Clubs, Rotary and Lions Club, 25 lectures | 1,776 |
| Girl Scout Classes, 45 lectures | 1,121 |
| Public Lecture-Demonstrations, 38 lectures | 3,548 |
| Educational Bus, Lecture Demonstrations, 120 lectures | 1,903 |
| Model Home Exhibits, White Plains and Port Chester, 2 exhibits | 11,971 |
| Merchants' Industrial Exhibit, 1 exhibit | 3,500 |
| Electrical Show, Grand Central Palace, New York City "Bus," 1 exhibit | 190,000 |
| | 213,819 |

**Activities Operating from Local Offices**

| | |
|---|---|
| Number of home demonstrations of new appliances | 2,823 |
| Number of home demonstrations by request | 601 |
| Number of follow-up calls on complaint orders completed by service department, both gas and electric— | |
| By personal calls | 3,653 |
| By telephone calls | 885 |
| Number of customers interviewed in demonstrating kitchens | 8,374 |
| Number of daily floor demonstrations in demonstrating kitchens | 834 |
| | 17,170 |
| Number of printed receipt sheets distributed | 35,000 |
| Number of books "Joys of Home Making" distributed | 1,002 |
| Number of lighting service announcements | 500 |
| Number of requests for special recipes received by general office | 326 |
| Number of requests for standard recipes received by local offices | 1,689 |

**Miss Conklin Reads Interesting Paper**

Miss Ethel A. Conklin, of the Consolidated Gas Company of New York, read a paper filled with the interesting activities of the women in that company. She spoke of the special study course, "From the Coal Pile to the Final Balance Sheet," which consisted of a series of 30 minute talks, by department heads, with stereopticon slides when possible.

Upon completion of this study course, the member writing the best article on the lectures received as a reward a trip to Chicago to attend the American Gas Association convention in October.

Miss Janet MacRorie, assistant to the Publicity, Public Service Corporation of New Jersey, spoke interestingly on introducing the gas company to the home makers.

Mr. H. M. Brundage, president Empire State Gas and Electric Association, in his talk emphasized the splendid work done by the women working together with the men.

The delegates at the convention during the afternoon of May 27 were shown through the WGY radio station and General Electric Company's plant under the direction of Mr. Allan D. Marshall.

A dinner was tendered the delegates by Mohawk Hudson Power Corp. in the evening at the Hotel Van Curler, Miss Sara Harris acting as toastmistress. A. O. Coggeshall and Ralph Jones of the WGY radio staff entertained.

**Educational Bus**

Mr. E. H. Rosenquest, president of Westchester Lighting Company, Yonkers, N. Y., in his speech told of the various methods used by his company in bringing educational features to the outlying districts of Westchester. He mentioned in some detail the educational bus of the company, which is completely outfitted for the comfortable accommodation of 37 persons and in which daily lecture demonstrations in modern home lighting, all phases of cooking and instruction in modern appliances are given to club groups, Girl Scouts, domestic science teachers, school pupils and numerous other organizations. Mr. Rosenquest said much of the fine work was done by the women in business.

Miss Grace A. Reavy, City Treasurer, City of Cohoes, met with a most enthusiastic reception when she spoke on the endurance of women in business and mentioned a worthy slogan for them to cherish—get hold, keep hold and never let go!

It is interesting to note that Mr. Rosenquest was one of a group of men in the utility industry to organize the Empire State Gas and Electric Association.

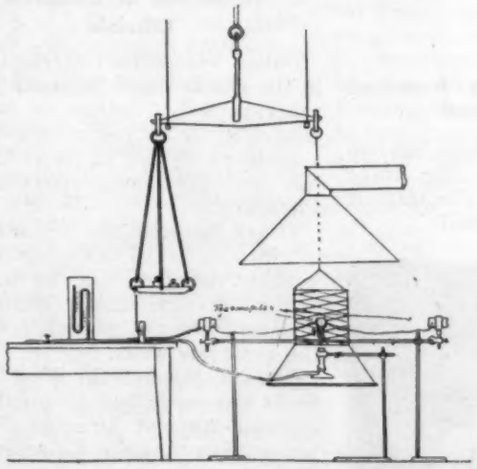
Mr. C. S. Ruffner, president Mohawk Hudson Power Corporation, Albany. Mr. C. M. Ripley, engineer General Electric Company, Schenectady; Mr. Frank A. Regan, secretary public speaking committee of the New York State Committee on Public Utility Information, were also among the speakers that held the close attention of the large audience.

The new officers elected were Miss Marie Reith, New York Edison, chairman, and Mrs. Hazel Somerville, Mohawk Hudson Power Corporation, vice-chairman.

# PROGRESS IN GAS TECHNOLOGY
## *Domestic and Foreign*

### RELATIVE IGNITIBILITIES AND COMBUSTIBILITIES OF COKE

IN CONDUCTING these investigations the coke was used not in the powdered condition but in the lump form, thereby retaining all the characteristics which influence its burning. The fire was allowed to burn under natural draft. A method based on the continuous weighing of a fire was used. A brazier was used, for the reason that it is simple in design, easily duplicated, capable of light construction, symmetrical about a vertical axis and less likely than the normal grate to mask the real effects of the coke itself on the behaviour of the fire.



The numerous factors that are connected with the burning of a coke fire fall into three groups and may be summarized as follows:

First, factors relating to the heap of coke as a whole, that is the dimensions of the heap, the size, shape and packing of the lumps, affecting area of reacting surface, ingress of air and heat dissipation.

Second, factors relating to the grate,, such as effect on heat dissipation, effect of ingress of aid (natural draft).

Third, factors related to chemical, physical and structural nature of the coke, such as moisture, ash (percentage, nature, fusibility and distribution), volatile matter (percentage, nature and distribution), structure, including hardness and density, allotropic condition of the carbon molecule, capacity for absorbing, conducting and radiating heat.

The weighing apparatus is shown in the illustration, the brazier containing coke being suspended from one arm of the scale and after igniting the coke readings were taken at which definite losses were noted.

The conclusions reached were as follows:

Various quantities and sizes of lump coke were ignited and allowed to burn to extinction (under natural draft) in various modifications of cylindrical brazier suspended from one arm of a sensitive balance.

The loss in weight involves moisture and volatile matter as well as loss by combustion, but records of the relative radiation intensities from the sides of the fires have been found helpful in interpreting the results.

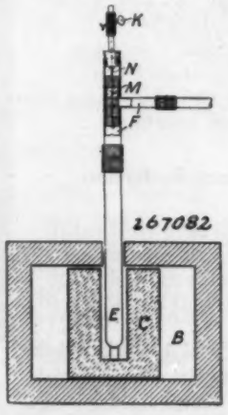
The important influence of the size of coke, grade, height of fire and natural draft so frequently experienced but the effects of which are not always appreciated in domestic practice, are clearly demonstrated by the results.

The tabulations in the original article, published in the Journal of the Society of Chemical Industry, May 6, 1927, pages 116T to 172T, give the duration and extent of burning.

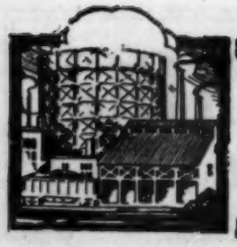
☼ ☼ ☼ ☼

### DISTILLING SAMPLES OF COAL

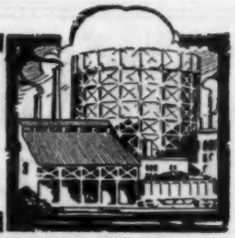
To test the properties of a coal the dry coal powder is molded into hard blocks, which are introduced into a preheated tube or retort, the free space in the tube being uniform for the various samples under test. A quartz distilling tube E extends into a heat accumulator C surrounded by a combustion space B. A T-tube F is connected to the distilling tube and receives the blocks M which are strung on a plati-




num wire N held by a clip K. When the required temperature is reached the blocks are dropped into the tube, the flame in combustion space B being extinguished. The horizontal part of the T-tube is connected to a receptacle for receiving the distillates. British Patent No. 267,082.



# NEWS OF THE GAS INDUSTRY



## Semet-Solvay Engineering Corporation Undertakes to Complete Construction of Water Gas Machines in Fifty Days

Waukesha, Wis.—Fifty days for the complete construction of a Steere water gas machine is the assignment undertaken by the Semet-Solvay Engineering Corporation, of New York, for the Wisconsin Gas and Electric Company here. It will be a six-foot set to take care of peak load demands. Work was authorized on Friday, May 13. The machine is due to make gas on July 4.

Automatic control and complete hydraulic operation will be provided. The new standard feature of the Steere water gas machine for keeping the superheater clean will be incorporated. This will be accomplished by extending the shell beyond the cone top, forming a gutter which prevents any moisture, condensate or spillage from running down the sides of the shell. This gutter is drained directly to the seal pot and is an improvement recently developed on which patents are pending. It was designed for Steere water gas machines to preserve the appearance of the shells and remove the objections to using light colored paints.

### Paint to Reduce Radiation

It has become pretty well established that aluminum paint produces radiation losses and adds materially to the thermal efficiency of the machine.

The gas made will be taken off through a 16-inch grasshopper connection to the relief holder.

The rate at which this construction work is going forward is largely attributable to the fact that the Steere water gas machine has been completely standardized and all important parts of the equipment are stocked. This eliminates delays from delivery of raw materials. Shipments are being made from the company's shop at Owosso, Mich., by rail to Grand Haven and across Lake Michigan. At the time of writing this work was somewhat ahead of schedule.

* * *

### H. T. Matthew Joins American Gas Journal Staff

Mr. H. T. Matthew, who has had a wide experience in the trade paper field, has joined the staff of the American Gas Journal.

*H. T. Matthew*

Mr. Matthew first entered the publishing field as representative of McGraw Publishing Company. For six years he was business manager of Electrochemical Industry (now Chemical and Metallurgical Engineering), and was then appointed western manager of Electrical World in their Chicago office. After three years he was Pacific Coast representative of the McGraw publications. For the past eight years he has been publicity manager of the Quigley Furnace Specialties Co. of New York.

* * *

### GAS MEN VISIT TEXAS FIELDS

#### Developments Expected to Follow Inspection of Columbia Officials

Dallas.—Important developments in the gas fields of Western Texas are expected to follow an inspection of the fields just completed by a group of officials of the Columbia Gas and Electric Corporation of Pittsburgh.

Other than that the trip was one of inspection of existing fields, nothing definite could be learned at the present time, but further announcements are expected within the next few weks.

The trip through the West Texas fields was made by automobile and included stops at Amarillo, Sweetwater, San Angelo, Coleman and Abilene.

The personnel of the party included George W. Crawford, Pittsburgh, chairman of the board of the Columbia Gas and Electric Corporation; Philip G. Gossler, New York, president of that organization, and F. W. Crawford, Columbus, O.; John G. Pew, New York, and T. B. Gregory, Pittsburgh, vice-presidents of the corporation.

T. B. Gregory and F. W. Crawford are directors of the Lone Star Gas Company, headquarters of which are in Dallas.

The officials were accompanied on their inspection of the West Texas fields by L. B. Denning, Dallas, president of the Lone Star Gas Company, and R. A. Crawford, Dallas, vice-president and general manager of that organization.

# U. G. I. Contracting Company Activities

Fond du Lac.—The U. G. I. vertical retort plant at Fond du Lac, Wis., created great interest at the time of its installation among managers of small and medium sized plants because of the good results and efficiencies obtained, as well as the fine appearance of the plant. The original installation also gave the officers of the company so much satisfaction by reason of the economy of operation that an addition to the original plant was decided upon.

The Wisconsin Power & Light Company, which operates Fond du Lac, has therefore contracted with the U. G. I. Contracting Company, of Philadelphia, for an extension which will include one additional bench of 9 U. G. I. vertical retorts together with attached producer.

**Construction Work**

Included in the work which the contracting company will do is the necessary building dismantling required for the new installation, also the putting in of new concrete foundations and supports, as well as all structural steel housing and piping. It will also refill the present benches which have been in service since 1924.

A U. G. I. new type lower foul main will be installed for the new bench, as well as for the present three benches. It is expected that the new installation will be completed in time for the winter load and with this additional capacity, the Wisconsin Power and Light Company will be able to give its customers the best service.

Pottsville, Pa. — The Pottsville Gas Company contemplates the remodeling of its 6 ft. carburetted water gas apparatus, and has placed orders with the U. G. I. Contracting Company for the necessary material for this work.

Waukesha.—The U. G. I. Model B Automatic Control still maintains its popularity among gas engineers and operators, as is evidenced by the fact that the Wisconsin Gas & Electric Company plant at Waukesha, Wis., will soon be operating its apparatus with one of these machines. The order was recently placed with the U. G. I. Contracting Company.

Middletown.—The C. H. Tenney Company, of Boston, is arranging to increase and improve the condenser equipment at the Middletown, N. Y., plant, which is operated under the name of Rockland Light & Power Company, and has placed an order with the U. G. I. Contracting Company for one 6 ft. U. G. I. 4 pass high duty condenser. This type of condenser is very much superior to the old style and will add greatly to the set operation of the Middletown plant.

Brooklyn.—The Cottrell Electrical Precipitation System continues to gain in popularity among gas engineers, and the latest order to be received by the U. G. I. Contracting Company is for a Cottrell having capacity of 25,000 cu. ft. of gas per minute for installation at the Greenpoint Works of the Brooklyn Union Gas Company.

* * *

## FLOOD RELIEF FUND WITHIN $27,000 OF GOAL

### Gas Light Company Employes Give $2,000 More

Chicago, on its last lap in the attempt to raise $1,000,000 for relief of the Mississippi flood victims, has a bit more than $27,000 to secure before the goal is reached.

An additional donation of $2,000 from the employes of the People's Gas Light & Coke Company headed the list of gifts arriving at the Association of Commerce. To date they have contributed $4,664.

* * *

### Demand for Gas Growing

Fort Collins.—The Public Service Company of Colorado, servitors of the city of Fort Collins, Colo., with natural gas from the fields nearby, find it necessary to spend about $20,000 for the extensions of its gas mains throughout the city. The work is to go right ahead.

## BUYS OKLAHOMA GAS CORP.

### Phillips Petroleum Gets Stock of Producing Company

The Phillips Petroleum Company has purchased a majority of the outstanding stock of the Oklahoma Natural Gas Corporation. The terms were not disclosed.

The Oklahoma Natural Gas Corporation is a pioneer gas company in Oklahoma, with more than 1,900 miles of pipe lines. Sales last year exceeded 27,000,000,000 cubic feet. The company supplies gas to 50 towns and cities in Central and Southern Oklahoma, including Oklahoma City, Tulsa, Muskogee, Okmulgee, Shawnee, El Reno and Guthrie. It also serves many industries.

R. C. Sharp will continue as president and general manager and L. C. Ritts as vice-president and treasurer. The owners plan to connect the company's present pipe line system with the Amarillo fields of Texas by laying more than 200 miles of 22-inch pipe.

Phillips Petroleum prior to this purchase was one of the largest producers of natural gas in that territory.

* * *

## GAS COKE PRICE TO BE REDUCED

### New Rate on Power Company's Product Goes into Effect May 15

Fond du Lac.—Fond du Lac gas coke prices will be reduced approximately $2 per ton, according to an announcement made by Fred Whitely, district manager of the Wisconsin Power & Light Company.

The reduction is made about this time each year to encourage patrons to fill their bins early in the season. Early buying will relieve the rush in the fall when the weather is colder.

Coke prices will be raised gradually as the time draws close to the rush period. This year there will be no advance until July 15, because of the construction work at the gas plant, where workmen are remodeling the coke screening and storage building.

## HAMPTON GAS COMPANY IS SOLD BY CASHMAN

### Unnamed Group of Granite State Men Buys Plant

Haverhill, Mass. — John Cashman, realtor, who purchased the Hampton Gas Company from the trustees in bankruptcy, has sold the property to an unnamed group of New Hampshire men, it was stated by Attorney I. Ashton Thorp, of the law firm of Thorp & Branch, Manchester, N. H., counsel for Mr. Cashman.

The sale was completed at the law offices of Thorp & Branch.

The new owners will incorporate under the name of the Hampton & Seabrook Gas Co. Attorney Thorp said he had been requested by the new owners not to reveal their names until the full personnel of the new company is decided upon. He said, however, that it is a bona fide sale to responsible parties already engaged in the production and sale of gas, who are entirely disassociated from Mr. Cashman or his interests.

Many improvements are contemplated by the new owners, and they promise satisfactory service and uninterrupted supply of gas. The gas will be turned on for the season on Memorial Day.

The Hampton Gas Co. has in the past purchased its gas from the Haverhill Gas Company, which delivered its gas at the state line.

* * *

### New Rates on June Billings

Indianapolis, Ind.—New reduced gas rates, the schedule for which was announced some weeks ago, will be made on June billings, with the result that the reductions will be applicable to May consumption, according to present plans of the Indiana Public Service Commission. The reduction was made after a study of local production conditions of the Citizens Gas Company. Another new schedule filed by Clarence L. Kirk, vice-president and general manager of the Citizens Gas Company, supplements the gas rate reduction and shows a reduction between 5 and 15 cents a lineal foot for installation of gas service.

### Convention Calendar

June

**16-17—Canadian Gas Association. Annual convention, King Edward Hotel, Toronto, Canada. G. W. Allen, secretary-treasurer, Toronto.**

**21-22—Empire State Gas and Electric Association. Annual meeting, Commercial Section, Elmira, N. Y.**

20-2—Second Short Course Industrial Gas Engineering, University of Illinois, Urbana, Ill. Charles Greenleaf, chairman, 325 Peoples Gas Building, Chicago, Ill.

July

**5-7—Michigan Gas Association. Annual convention, Grand Hotel, Mackinac Island, Mich. Albert G. Schroeder, secretary-treasurer, Grand Rapids, Mich.**

### Feeding of Natural Gas Strikes a Snag

Cheyenne.—The Cheyenne Light, Fuel and Power Company, a subsidiary of the Public Service Company of Colorado, discarded artificial gas and is serving its customers with natural gas from the Wellington, Colo., field. The natural gas is very dry and it has been found necessary to cut holes 2 x 4 feet about every ten feet in the pavement above the pipes to admit moisture. The explanation is given as follows: The joints of the pipes to convey artificial gas were caulked with oakum. Absorbing moisture from the artificial gas swelled and made a tight joint, but with no moisture from the dry gas it is feared that the oakum will become so dry that it will crack and cause leakage. To prevent this, the holes were made and in addition a rubber ring at each joint of the pipes will be compressed by tightening with bolts running through the male and female units, the cost to be about $35,000. To do this the pipes, 12 feet in length, must be excavated. A. H. Reed Construction Company of Omaha, with an asphalt and concrete plant at Cheyenne, has been given the contract.

## BROOKLYN UNION GAS CO. STAGES ESSAY CONTEST

### Contest Limited to Employees

Brooklyn.—Much interest is being shown by the associates of the Brooklyn Union Gas Company in the essay contest which started June 1.

The Brooklyn Union Gas Company is offering $500 in prizes to the employees for the best essays on the gas industry. The title of the paper is to be "The Influence of Gas Service in the Growth of Brooklyn."

There will be a $150 capital prize, second prize $75, third $50 and fourth prize $25. There will also be ten honorable mention prizes of $10 each.

A fund of $100 has been set aside to be apportioned to those making the best suggestions for the improvement of the gas industry in Brooklyn.

The contest is limited entirely to employees. The committee in charge are George M. Kirchmer, E. J. Devlin, E. C. Uhlig and E. H. Marsh.

The final judge of the papers will be Major Alexander Forward, managing director of the American Gas Association.

The contest will close on August 1 and prizes will be awarded in September.

* * *

### Sterrett Sees Big Expansion for Utilities

Des Moines.—Development and expansion of service by public utilities of the United States during the next several years along lines even broader than in the past is foreseen by H. R. Sterrett, vice-president and manager of the Des Moines Gas Company, who returned from a week's conference of the United Gas Improvement Company in Philadelphia.

Mr. Sterrett stated that leaders in the gas industry reported at the meeting that notable advances during the next several years would be in the heating of homes and buildings by gas, the increase in the use of gas for industrial purposes, and development of appliances which will still further add to the conveniences of having gas in the home.

### Western Gas Construction Co. to Spend Half a Million for Erection of New Buildings

Ft. Wayne.—A construction program involving the expenditure of approximately $500,000 has been announced by officials of the Western Gas Construction Company of Fort Wayne, Ind. The program includes the erection of new buildings, consisting of a machine shop, forge shop, extension to the store room, shop office to house the time keepers, a machine shop office, superintendent's office and a combined employment and first aid building.

The new machine shop will be 140 by 470 feet, of structural steel with brick walls and steel sash. Facilities for handling material will consist of one five-ton crane, one 15-ton crane and eight three-ton cranes, in addition to several jib cranes.

The forge shop will be 48 by 80 feet. The storeroom extension will be 180 by 60 feet.

The office building will house the storeroom and shop office force and the superintendent's staff and will be centrally located in regard to the other buildings.

* * *

### F. J. Gest, District Manager Ruud Manufacturing Co., Southern Illinois

F. J. Gest, recently appointed district manager in Southern Illinois for the Ruud Manufacturing Company, is probably the most traveled member of the water heater industry.

Mr. Gest spent nearly ten years in Central and South America and for most of this time traveled extensively. South America, the land of a revolution per minute, seemed to agree with Mr. Gest. Thoroughly acquainted with the customs and languages spoken, he was very successful in all his undertakings.

The call of the country of his birth, the United States, proved stronger, however, than the lure of foreign countries. So he returned to the Ruud Manufacturing Company, for whom he had traveled for many years in Northern New Jersey.

### Gas Machinery Co. Awarded Contract for Water Gas Set

Decatur. — The Gas Machinery Company, of Cleveland, Ohio, has been awarded contract for the installation of a new 9 ft. carburetted water gas set in the gas plant at Decatur, Ill.

The contract includes overhead brick operating floor, provision for future waste heat boiler, aspirator for bituminous coal firing, automatic control and hydraulic circulating system.

The contract also includes new 25 ft. diameter by 12 ft. high, steel purifying equipment, and cooling scrubber with coils for same.

Danville. — The Gas Machinery Company is installing sectional silica retorts and settings in the gas plant at Danville, Ill., and also in the gas plant at Carlinville, Ill.

Sectional silica retorts have practically entirely replaced the clay retorts used for coal gas benches, on account of their longer life and greater efficiency.

* * *

## LECTURED AT HIGH SCHOOL

### N. D. Lambert, Jr., Explains Gas Meter

Mr. N. D. Lambert, Jr., of the Lambert Meter Co., Brooklyn, N. Y., gave an illustrated lecture on a gas meter to the students of the Chemistry and Physics classes of the Suffern High School. The meter used in the demonstration was the one which has been on display in the office of the Ramapo Gas Corporation and which was loaned by the Lambert Meter Co. It is planned that the students will visit the gas plant, where Mr. Barnard will demonstrate, step by step, the manufacture of coal gas.

* * *

### Approve Corporation

Lansing.—The Michigan Public Utilities Commission has approved the articles of incorporation of the Gas Corporation of Michigan, with headquarters in Ludington, and granted authority to issue $25,000 no par value stock. The corporation will operate in Ludington, Mt. Pleasant, Greenville and Clare.

### John B. Reynolds Associates with the Middle West Utilities Co.

Appointment of John B. Reynolds, former director of the industrial development department of the Middle West Utilities Company of Chicago, has been announced. The company is the parent corporation for several hundred utility corporations in the Middle West, many of which are in Indiana, where Mr. Reynolds is well known. At the present time Mr. Reynolds is in Maine on business for the corporation. He was general secretary of the Chamber of Commerce for seven years and retired in March after that body was reorganized. He was a colonel during the world war.

* * *

## NATURAL GAS LINE TO NEW ORLEANS READY SEPT. 1

### Engineers See Two and One-Half Million Feet Flow

New Orleans.—Natural gas will be available for New Orleans about September 1, if a pipe line extension from Baton Rouge to New Orleans, more than one-third completed, is carried through. Ford, Bacon & Davis, engineers in charge, decline to reveal the identity of the interests for whom they are building the line. Natural gas from the Monroe fiedds will be delivered to the suburbs of the city at the rate of 2,500,000 cubic feet per hour. This figure is the peak load per hour for artificial gas consumption for the entire city of New Orleans.

Negotiations between the city and those interested in bringing gas here have not begun.

* * *

### Commission Grants Permission for Extension of Mains in Chautauqua County

Albany.—The Public Service Commission has granted the petition of the Pennsylvania Gas Company for permission to extend its gas distribution mains in the villages of Lakewood and Celeron and in the town of Carroll, Chautauqua County, and approved of the exercise of franchises theretofore granted by these municipalities.

### George B. Cortelyou Elected Chairman of Joint Committee of National Utility Associations—Gadsden Elected Vice-Chairman

New York.—George B. Cortelyou, president of the Consolidated Gas Company of New York, has been elected chairman of the Joint Committee of National Utility Associations, representing the gas electric and street railway industries of the United States, according to announcement made this week. Philip H. Gadsden, vice-president of the United Gas Improvement Company of Philadelphia, was elected vice-chairman and chairman of the executive committee. Stephen Davis, formerly judge of the Supreme Court of New Mexico and solicitor of the Department of Commerce, has been appointed counsel of the committee.

Accompanying the announcement of the election of officers of the committee was the following statement from Mr. Cortelyou: "The joint committee of National Utility Associations was organized soon after the war ended. It succeeded the National Committee on Public Utility Conditions, which was organized during the war to meet the new and complex problems thrust upon the utility industry by the war. That committee, composed of Messrs. P. H. Gadsden, chairman, E. K. Hall and H. H. Crowell, not only rendered very effective service to the public, but enabled the industry to co-operate with the Government in all matters looking to the prosecution of the war.

"It was in recognition of the great value of co-ordinated effort in all matters affecting the industry as a whole that the Joint Committee was formed on the discharge of the National Committee at the close of the war. The Joint Committee is representative of the American Gas Association, the National Electric Light Association and the American Electric Railway Association."

Figures compiled several months ago by State public utility information committees in various parts of the United States showed that approximately 5,800,000 individuals hold securities of the gas, electric and street railway utilities in this country. That estimate is based on direct investments. Insurance companies and banks, with 28,000,000 depositors, also hold public utility securities.

* * *

### Contract Awarded to Western Gas Construction Co.

The Western Gas Construction Company has received contract from the Consumers Power Company of Jackson, Mich., for the necessary iron work, covers and connections for three 28-foot diameter concrete purifiers, for installation at their plant at Flint, Mich. The gas company is planning on having these boxes in operation by the first of September.

* * *

### Work on Gas Holder Is Begun

Gloversville.—The work of assembling the huge new gas holder being erected by the Fulton County Gas & Electric Company at its Hill street plant was commenced, when a gang of metal workers in the employ of the Stacey Brothers Gas and Manufacturing Company commenced riveting together the plates.

Erecting Engineer Kesterson of the company is directing the work on the holder, which will have a capacity of 750,000 cubic feet when completed. It is by far the largest storage unit of the company.

* * * *

## HOT WATER PROBLEM IS SOLVED BY LOCAL GAS COMPANY

### Queensboro Co. Is Featuring Instantaneous Automatic Heaters

Far Rockaway. — The Queensboro Gas and Electric Company, after a thorough investigation of various sizes and makes of water heaters, have selected a gas water heater which they offer their customers at a price installed complete, within the reach of all who are desirous of sharing in the comfort of an unlimited flow of hot water.

## RUUD MFG. CO. OPENS NEW BUILDING

### Location One of the Best in Boston

Boston.—Located at the corner of Cambridge and Joy Streets in Boston, the new branch building is, because of its frontage on Cambridge Street, on the second heaviest boulevard in the city, one that has been recently widened to 100 feet to care for the ever-increasing traffic.

From the north, south and west, it is easily reached without the necessity of getting into the congested downtown traffic area. Parking rules are liberal and there is ample parking space.

Within a half mile radius will be found about half of the offices of Boston architects. The new building is handy to the Boston Architectural Club, to the Boston City Club, to the State House and to subway and elevated stations.

* * *

### International Combustion Engineering Corp. Appoints W. B. Senseman District Manager for Pacific Coast

William B. Senseman has been appointed Pacific Coast district manager for Combustion Engineering Corporation, Raymond Bros. Impact Pulverizer Company, Ladd Water Tube Boiler Company and Heine Boiler Company, all subsidiaries of International Combustion Engineering Corporation.

Mr. Senseman has been associated with Raymond Bros. Impact Pulverizer Company for the past 15 years and since 1917 has represented that organization on the Pacific Coast.

The new consolidated offices are located in the Subway Terminal Building, 417 South Hill Street, Los Angeles, Cal.

* * *

### To Extend Service

Sarasota, Fla.—Acting Mayor W. H. Stephens declared his belief in the early extension of gas service mains into Sarasota from the Bradenton plant. John A. Reed, who recently purchased an option on the local gas franchise, has representatives here now.